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JULY/AUGUST 2008

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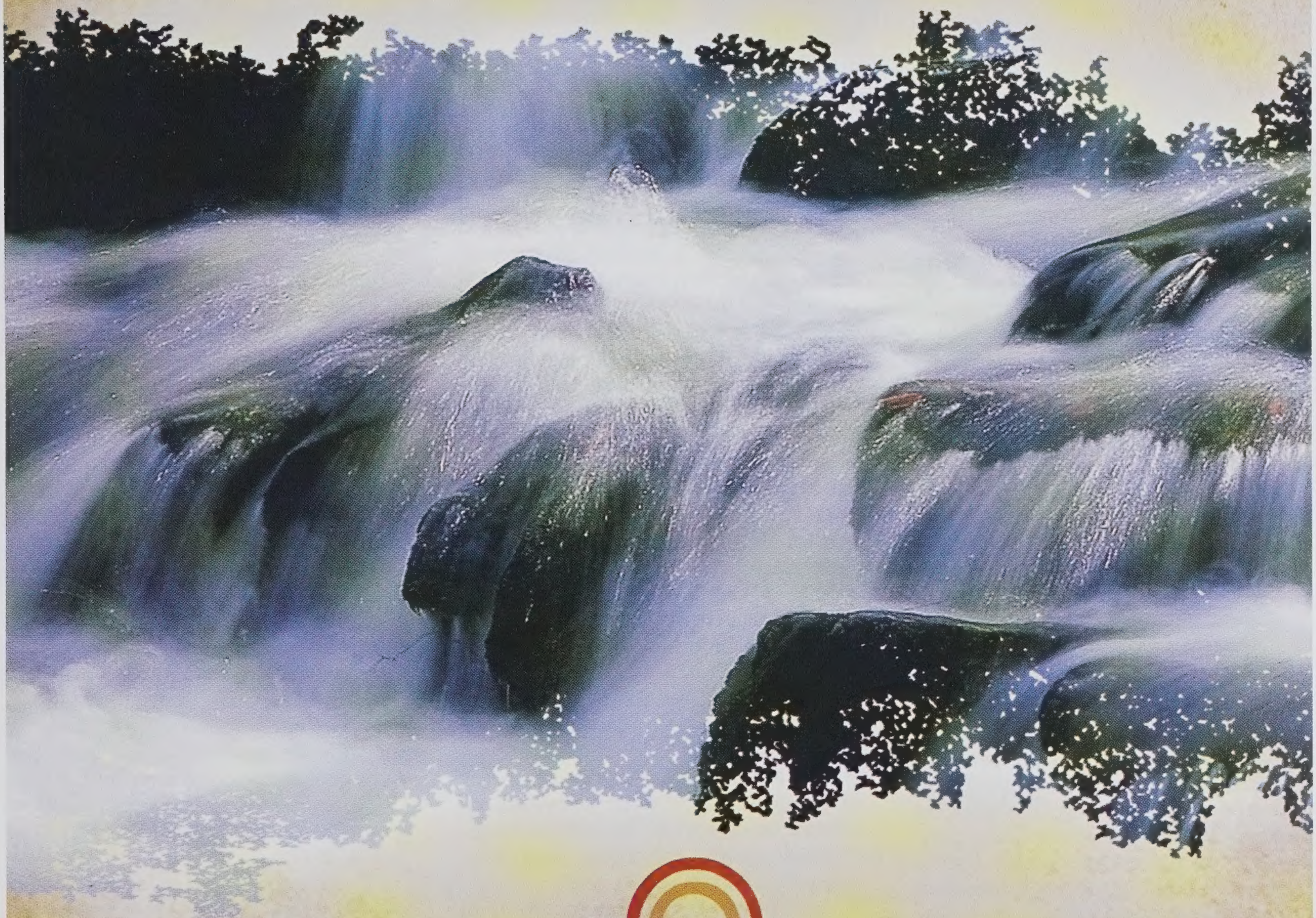

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Oxygen ingress into bottled wine

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Oxygen plays an important role in wine development. Work carried out at The Australian Wine Research Institute[1,2,3,4] and elsewhere has shown that a single wine bottled with a different closure or headspace develops into several different wines. These different wines age in different ways.

Closures that allow different amounts of oxygen into a wine are a large part of this differentiation. In addition, a relatively large amount of oxygen at bottling appears to have a different impact than a small amount entering a bottled wine over several years.[2]

Wines can be exposed to oxygen at different stages of the winemaking process. Some of the more likely periods for oxygen pickup occur during transfer operations through hoses, at filtration and during bottling. At the bottling stage, oxygen pickup can occur in the filler bowl due to turbulence, from air in the headspace of bottles, and from the closure.

This article will focus mainly on the role of the closure at insertion and after bottling.

During bottling, there is a strong possibility that air can be sucked into a bottle after insertion of a closure, if the vacuum-corker is set to achieve negative pressure under the closure, especially if the closure is slow in expanding.

In addition, when a closure is inserted into a wine bottle-neck, the closure is compressed and air diffuses out in all directions including into the wine bottle headspace. This is another opportunity for oxygen pickup in the wine. The proportion that moves into the headspace compared to the proportion that moves outside the bottle will depend on the pressure under the closure, with greater transfer into the ullage at more negative headspace pressures.

After bottling and during storage, the main mechanism for oxygen exposure is through the closure. Oxygen transmission rate (OTR) of a closure depends on:

- the inherent permeability of the material to oxygen;
- the area of the closure exposed to air;
- the length of the pathway that oxygen must travel to get through the closure to the wine;
- the integrity of the closure/bottle interface (presence of longitudinal creases or cuts from the corker, longitudinal cracks in corks, and rim-integrity of screw-caps); and
- the difference in concentration of oxygen outside and inside the bottle.

Everything else being equal, an OTR will be lower for a longer closure than a shorter closure, but this reduction will only be realized if the neck bore allows contact with the closure for the entire length of the closure. If a 44 mm long closure in a bottle is used where the bore is only controlled or within specification for the first 32 mm and then flares out, there could be 12 mm of closure length at the base that is not as tightly sealed against the bottle bore and is, therefore, not acting as effectively as a barrier as the rest of the closure.

The OTR for a closure is usually expressed either as mL per day or year or mg per day or year, measured at a recorded temperature (°C) and relative humidity (RH %), and, to be more correct, should be given as mL per closure per time period at (value) °C and (value) RH %, with the closure and bottle neck bore dimensions specified.

This is important as different bottle dimensions are used in different countries around the world. We advise a careful examination of the differences in neck bores of bottles used for the OTR estimation and those that will be used in commercial practice.

Some test laboratories use standard glass tubes with perfectly parallel sides rather than wine bottles to determine an OTR. These may be useful for quality control purposes for the closure manufacturers, but they may give more consistent and higher OTR results than those obtained in practice with commercial bottle bores.

The oxygen content of the atmosphere in which the closure OTR was determined also needs to be stated as the OTR increases as oxygen concentration or partial pressure increases. The error associated with an OTR value should also be given. The take home message is that the OTR values given for a closure are of most use for wine packagers if the conditions in which the rates were determined are close to those in which the closure will be used in practice.

When an OTR is given in terms of a concentration (mL per L per year or mg per L per year), the volume of the wine bottle for which this measurement is made also needs to be specified (for example, an OTR of 2 mL/L/year is equivalent to 2.7 mL/L/year in a 750 mL bottle and 5.3 mL/L/year in a 375 mL bottle).

How can OTR data be used?

Based on the work of Peter Godden *et al*[1] and others, a level of about 10 mg/L free SO_2 appears to be the point at which oxidative characters develop in a white wine. Roger Boulton *et al.* indicated that, theoretically, 1 mg of oxygen can consume 4 mg of SO_2.[5] If we are prepared to accept a few assumptions, we can calculate the shelf life of a wine.

The assumptions are as follows:

- The main reaction of dissolved oxygen is with SO_2. We know that oxygen also reacts with other compounds in wine because we also observe changes in aroma and color when wines are exposed to oxygen, but it is a workable assumption for white wine.
- Bound SO_2 does not equilibrate with free SO_2. This is not likely to be strictly correct, but again, it is a workable assumption. Accepting this assumption means we will slightly overestimate the decrease of free SO_2 because we are not accounting for any replenishment that could occur from the bound form.

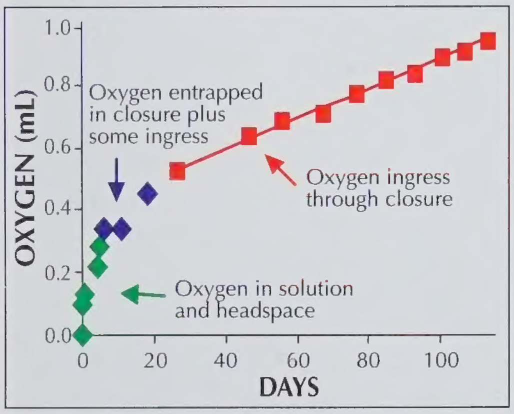

Figure 1: The ingress of oxygen into a 375 ml volume wine bottle sealed with a Nomacorc closure during storage at 18°C. Oxygen content was determined from the loss of BPAA (224 mg/L initial concentration) in a 10% (v/v) ethanolic solution adjusted to pH 3.8 with HCl and containing methylene blue (16 mg/L). Flint bottles (ACI 15592P with GCM finish) were filled under nitrogen and sealed with a Nomacorc closure (43 x 22 mm, lot number 1042 dated 01/31/03) using a single head vacuum corker set at 16 mm compression with a head space pressure of –10 kPa.

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- SO_2 is only lost through oxidative reactions. This is not strictly correct as there is some evidence that loss of SO_2 can occur under anaerobic conditions.[2] This quantum of loss due to these non-oxidative reactions is likely to be small compared to those due to oxidative reaction, so again, this is a workable assumption.
- The amount of oxygen present in the wine and package at bottling is known.

Consider a white wine with low phenolics containing 30 mg/L free SO_2 at bottling and, an 1 mg oxygen pickup at bottling sealed with a closure having an OTR of 2 mg/year/closure. After bottling, the SO_2 loss will be (1 × 4) = 4 mg SO_2 due to oxygen pickup. In one year, the SO_2 loss will be (1 × 4) = 4 mg SO_2 due to oxygen pickup and (2 × 4) = 8 mg SO_2 due to oxygen ingress; a total of 12 mg SO_2. In the second year SO_2 loss will be (2 × 4) = 8 mg SO_2 due to oxygen ingress. If the closure is in a 750 mL bottle, this equates to a loss of (12 / 0.750) = 16 mg/L SO_2 per year in the first year and (8 / 0.750) = 10.7 mg/L SO_2 in the second year. Thus the wine is predicted to show signs of oxidation between one and two years because the free SO_2 level decreases to ((30 – (16 + 10.7)) = 3.3 mg/L after two years.

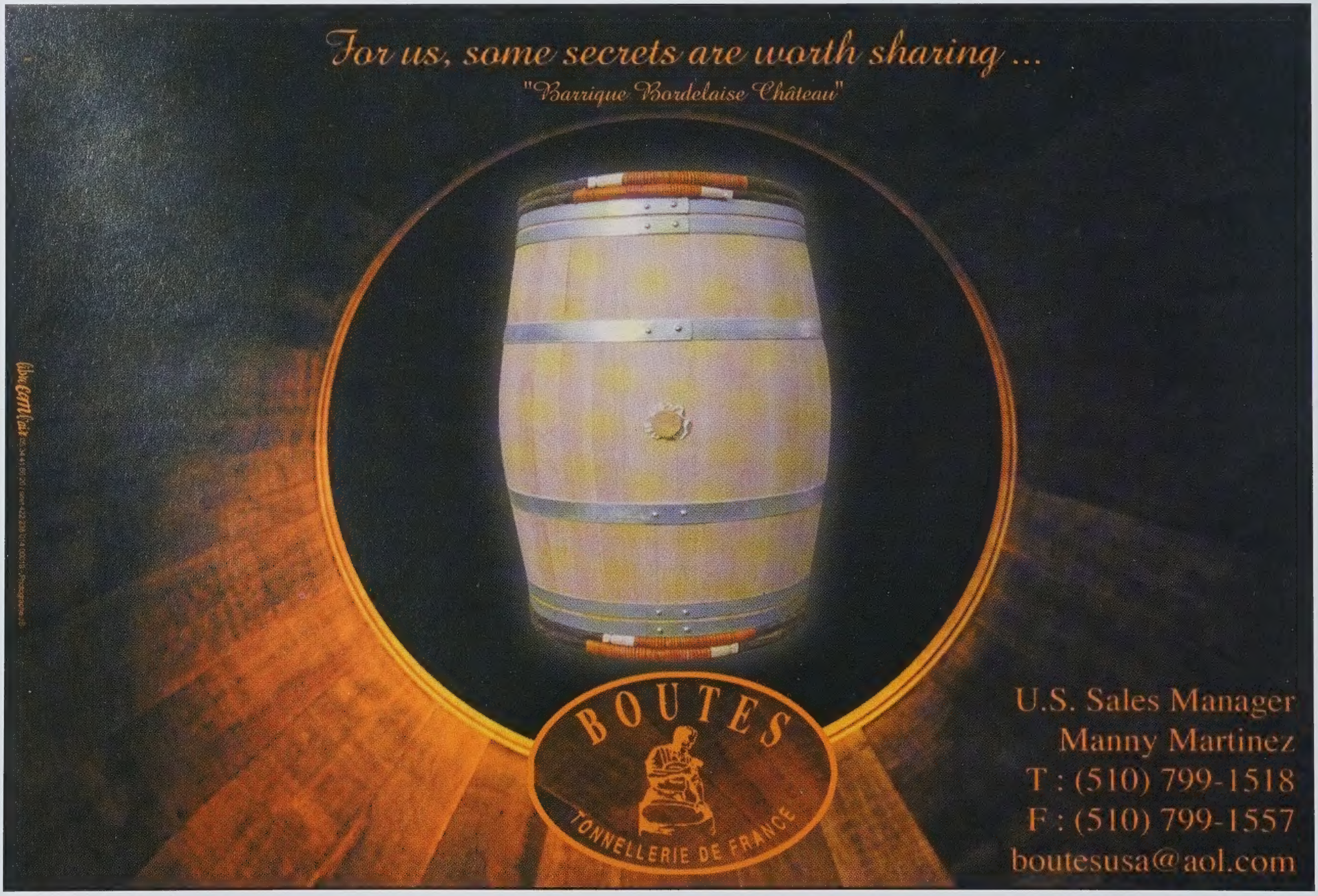
If the closure is in a 375 mL bottle, this equates to a loss of (4 + 8) / 0.375) = 32 mg/L SO_2 in the first year. The wine is predicted to show oxidative damage before the end of one year, when all free SO_2 will be consumed.

These simple calculations illustrate how OTR data could be used. If we had a better understanding of the relative rates of the reactions involving oxygen and SO_2 in wine, such calculations could be made with greater accuracy. In addition, we also need to know the impact of temperature on both the OTR and reaction rates of wine compounds with oxygen to be able to predict how storage temperature would impact on wine development. Together with extensive OTR data, this information is necessary to develop good models to predict shelf life.

How is OTR determined?

Several commercial operations offer an OTR analysis service using the OX-TRAN® series of instruments produced by Mocon® (www.mocon.com). The principle of these instruments is to use a permeation cell made of two chambers separated by the membrane or closure. This method is considered by many as the "gold" standard for measuring OTR. Air or oxygen is supplied to the upper chamber and a constant flow of a carrier gas, usually nitrogen, to the lower.

Permeation of oxygen through the test material is detected in the carrier gas outlet from the lower chamber, after steady state has been achieved, by electrochemical methods. The test can be undertaken on necks cut from wine bottles so that that closures can be tested in the package they are expected to perform in and after being inserted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into this package under normal commercial conditions.

The humidity of the carrier gas can be manipulated so that condensation occurs in the headspace of the samples. While this does not exactly replicate the conditions in which closures perform commercially, such as in contact with an acidic, ethanolic solution under some degree of pressure, it is close.

The OxySense™ system www.-oxysense.com) can also be used to determine permeation rates. This system uses a 5mm diameter oxygen-sensitive sensor sensor (OxyDot™) made of a fluorescing dye immobilized in a porous hydrophobic matrix. The sensor is applied to the inside of a bottle. To determine the oxygen concentration in a bottle, the sensor's dye is illuminated by an OxySense analyzer and its resulting fluorescence is quantified. The reduction in fluorescence after illumination is thus a measure of the amount of oxygen present in the package. Similiar systems are also available from other manufacturers such as Presens Gmbtt (www.presens.de).

An OxyDot can be placed in a bottle in any location; in contact with the gases in the ullage or within the bottle in contact with the wine. While this method is non-destructive and technologically simple, it has at least one potential disadvantage for use in wine bottles and for permeation determinations.

It is not known whether the quenching of fluorescence by oxygen would compete with reactions between oxygen and other wine compounds. This potential disadvantage could be overcome by bottling model wine or water into wine bottles with the OxyDot; a similar approach to that of George Crochiere using an Orbisphere to measure dissolved oxygen rather than the OxyDot system.[6]

One additional problem that would occur if this latter approach of using model wine was taken is related to the fact that the method does not consume oxygen.

The driving forces for oxygen transfer through a closure is concentration — oxygen that enters the headspace dissolves into wine and is removed or lost through reaction, this drives more oxygen from the headspace into the wine and more from the exterior environment through the closure into the headspace. The OxySense™ system would not provide this driving force

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and permeation rates calculated using this system could be lower than those occurring commercially.

Recently, Paulo Lopes and colleagues at Bordeaux University developed a colorimetric method to determine OTR in wine bottles.[7,8,9] This method is based on the color change from the oxidation-reduction reaction of indigo carmine from the leuco form. Indigo carmine solution is added to wine bottles and then reduced to the yellow form by addition of sodium dithionite under an inert atmosphere, usually a blanket of nitrogen. This step needs to be carefully controlled so that no more reductant is added than that needed to reduce the dye.

The bottles are then sealed with the closures of interest and color changes that occur (due to oxygen ingress) over time are monitored. The technical challenges of adding only as much sodium dithionite as needed is a disadvantage of this method. While the method uses authentic wine bottles that can be stored under realistic wine conditions, the use of indigo carmine solutions with sodium dithionite means that the performance of closures is not being tested under conditions close to wine (ethanolic solutions with acidic pH). Despite these potential problems, the data obtained by the method is consistent with that obtained by others on similar closures in similar bottles by the OX-TRAN® method.

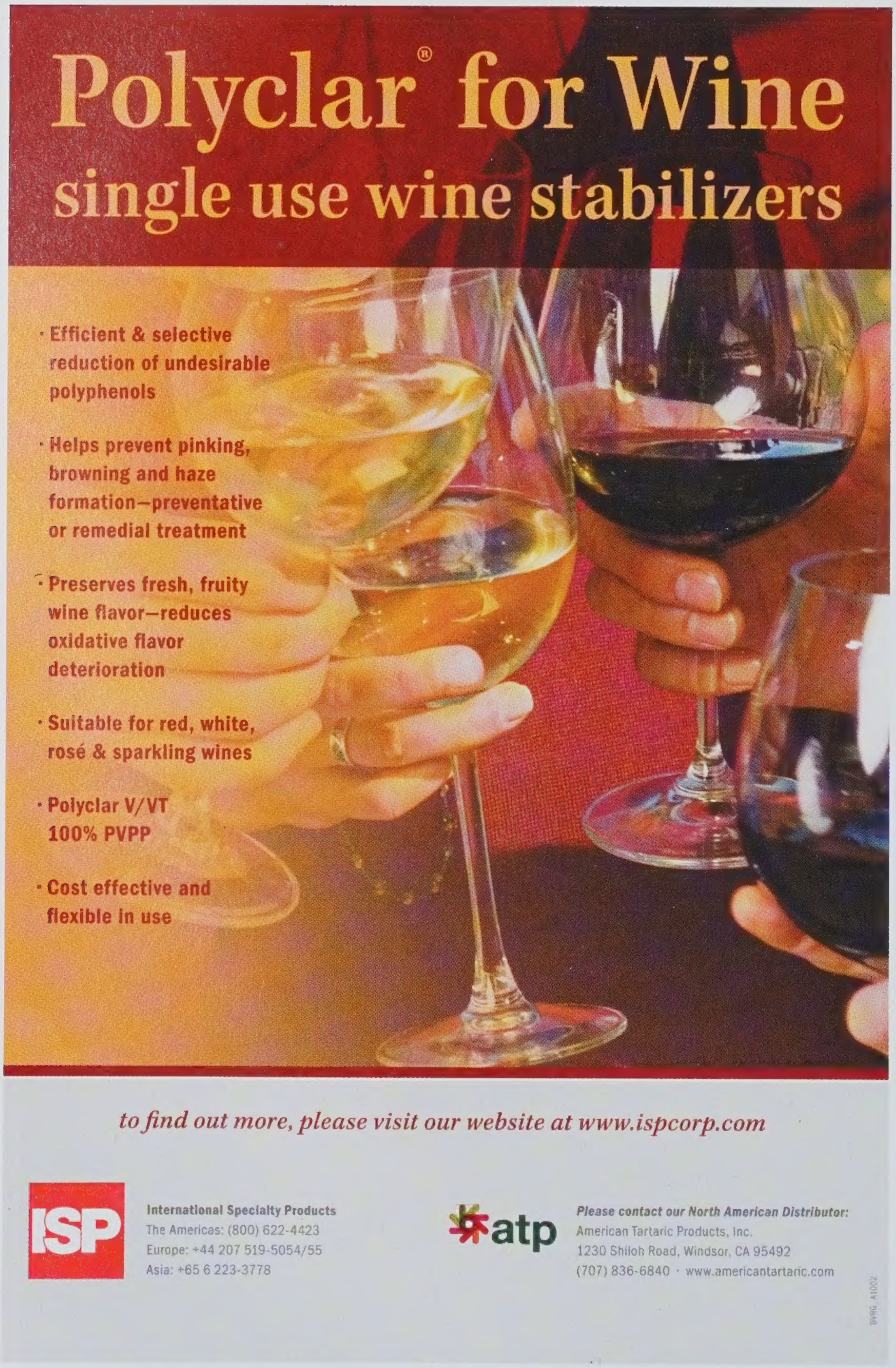
Given the potential problems with all current methods, we developed an alternative method that would allow us to determine OTR under conditions that reflect the commercial reality of the environment in which closures are expected to perform. In other words, we wanted a method that tested the closures under physical conditions that mimicked reality. These ideal conditions are:

- Closures are inserted into wine bottles by normal commercial practices and to normal commercial specifications;
- Closures are in contact with wine-like solutions (alcohol and acidity);
- Closures are tested under temperature and humidity similar to those encountered in practice; and
- The method removes oxygen from the system in a similar manner in which wine consumes oxygen.

New method

The method developed by the AWRI uses a dye reagent, bis-9, 10-anthracene-(4-trimethylphenylammonium) dichloride [BPAA], to react with oxygen in a bottle. This reaction can be monitored non-intrusively without destroying the closure. BPAA is a cationic salt that is soluble in ethanolic solutions at wine pH and, in our method, is used as a solution in model wine (10% to 15% (v/v) ethanol at pH 3.2 to 4.0).

BPAA absorbs light in the visible region. When BPAA reacts with oxygen, it is converted to a colorless compound. One molecule of oxygen reacts



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with one molecule of BPAA. Loss of BPAA can be measured by loss of color from the system and the loss of BPAA is equivalent to the amount of oxygen that has entered the bottle. By making these measurements over time in the same bottle, we can calculate an oxygen ingress rate.

Oxygen can exist in different states: a ground (the triplet) state; or an excited or reactive (the singlet) state. Dissolved oxygen exists predominantly in the ground state.

For oxygen to react with reagents such as BPAA it needs to be in the excited or reactive "singlet form" state. In the AWRI system, we achieve this through transfer of energy from a light-activated pigment: methylene blue.

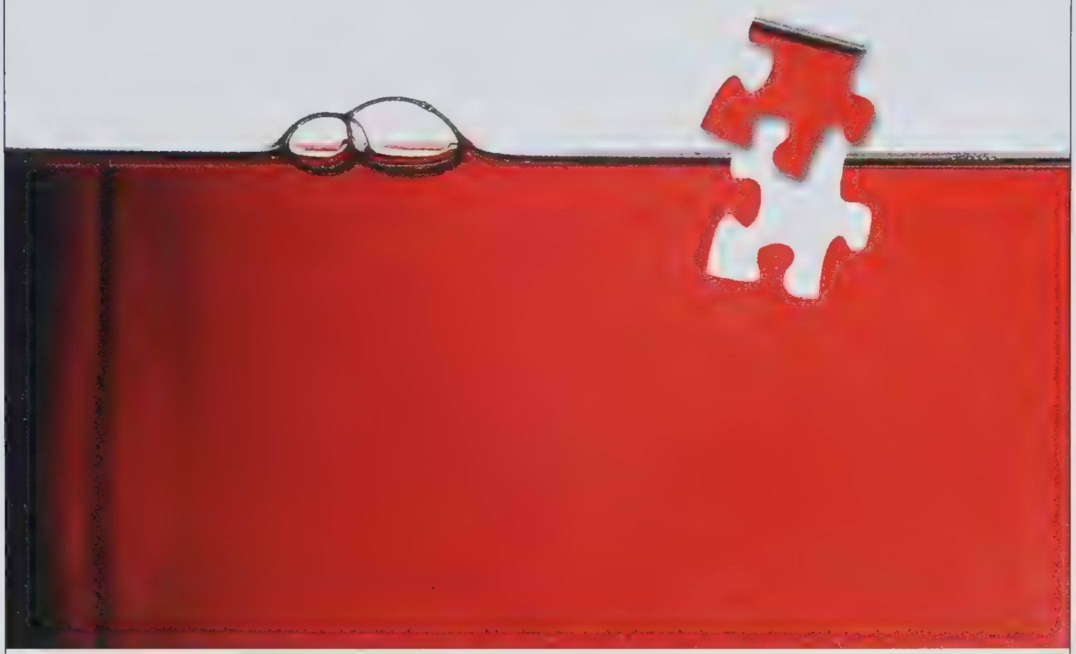
With the "flick of a switch," a lamp is employed to illuminate bottles and the energy is transferred to methylene blue (the "sensitizer" pigment) , which then excites the oxygen from its ground to reactive state. Once the oxygen molecule is in its reactive singlet state, it reacts with BPAA, and BPAA is converted to its colorless form and the oxygen is consumed.

An example of the data obtained from this method is shown in Figure I. These measurements were made non-destructively from model wine in a wine bottle. There are three "phases" or "zones" evident in the data.

The first phase is the measurements probably relates to the dissolved oxygen in solution; oxygen in the headspace dissolving in the solution; and oxygen expelled from the closure into the headspace after insertion into the bottle.

In the second phase, the data is likely a result from oxygen that is still present in the closure and is slowly diffusing and equilibrating out to the headspace in addition to oxygen that is diffusing or permeating, through the closure, especially along the sides of the closure-glass interface.

The loss of BPAA in the third phase is primarily due to oxygen ingress through the closure. We can fit a line to these points and use the slope of the line to determine the closure-OTR. Accuracy of the data obtained (non-destrustively) from such experiments can be further checked at the end of the trial. Once the light is switched off, the amount of BPAA remaining in the bottle, and thus the total loss of BPAA during the experiment, is fixed. The clo-



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sure can be removed and the BPAA loss determined accurately in a cuvette.

We consider this method has considerable potential for application in the wine industry to determine closure OTRs and measure oxygen pickup at bottling. This method provides more data than other methods currently available. Most important, it provides a more realistic simulation of real wine bottle conditions and provides valuable information about how initial headspace environment may influence oxygen ingress.

We envision that the method could be relatively easily extended to commercial high-speed bottling lines with the simple addition of a dispenser to add a concentrated BPAA and methylene blue solution into bottles containing model wine prior to closures being inserted or applied.

Conclusion

The differences among wines created by different closures or bottling conditions has the potential to be of much greater magnitude than that caused by many vineyard or winemaking variables. This is not to say that the vineyard and winemaking variables are not important, but that there is also potential for change induced by packaging and mediated by relatively low levels of oxygen.

There is a significant gap in our knowledge regarding the role of oxygen during development; how much is too much, when, and at what rate? Tools are needed to help address this problem. The new AWRI method using BPAA for determining OTR is one such tool. The BPAA method can be used to determine OTR under commercially relevant conditions, to directly evaluate headspace treatments and to audit bottling lines.

Bottling and packaging choices present an opportunity for maximizing and optimizing wine flavor development. In essence, "winemaking" does not end in the bottling hall but continues after the wine is bottled.

However, it will only be possible to realize these opportunities and gain the market advantages offered by them with closures that are homogeneous in their OTR and in their sealing performance and with bottling processes that deliver consistent low oxygen pickup. Ideally every bottle in a case of wine should develop identically, to deliver what the consumer expects and to be as the winemaker intended. ■

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"The influence of ascorbic acid on the composition, colour and flavour properties of a Riesling and wooded Chardonnay wine during five years' storage." *Aust. J. Grape Wine Res.* 11: 355–368.

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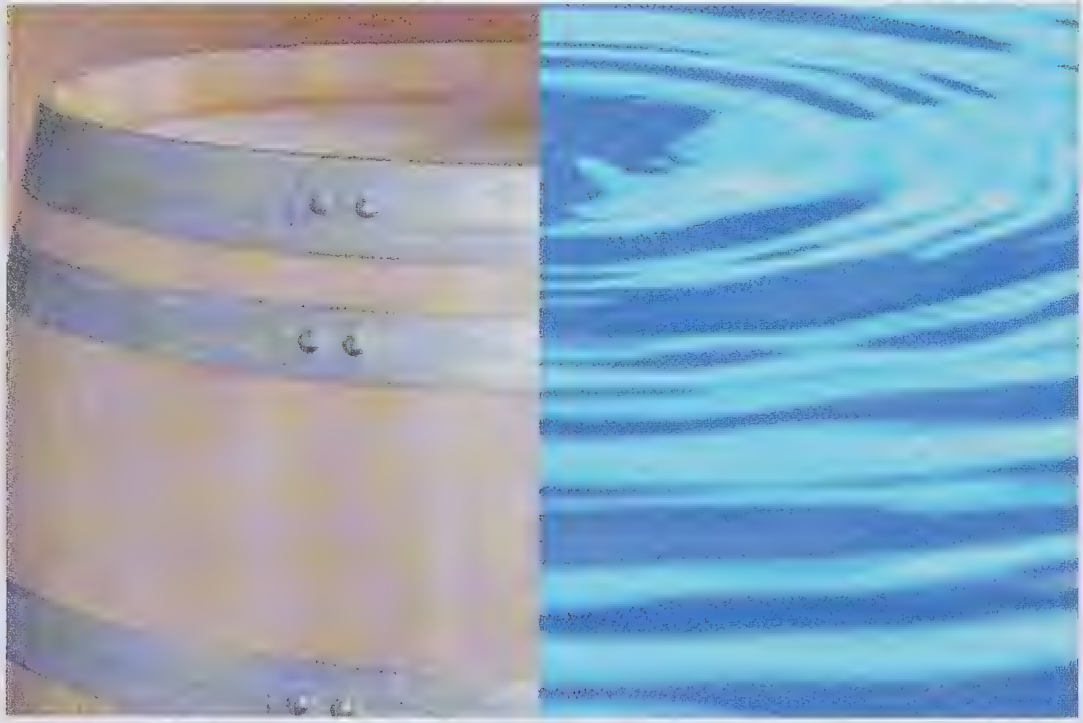

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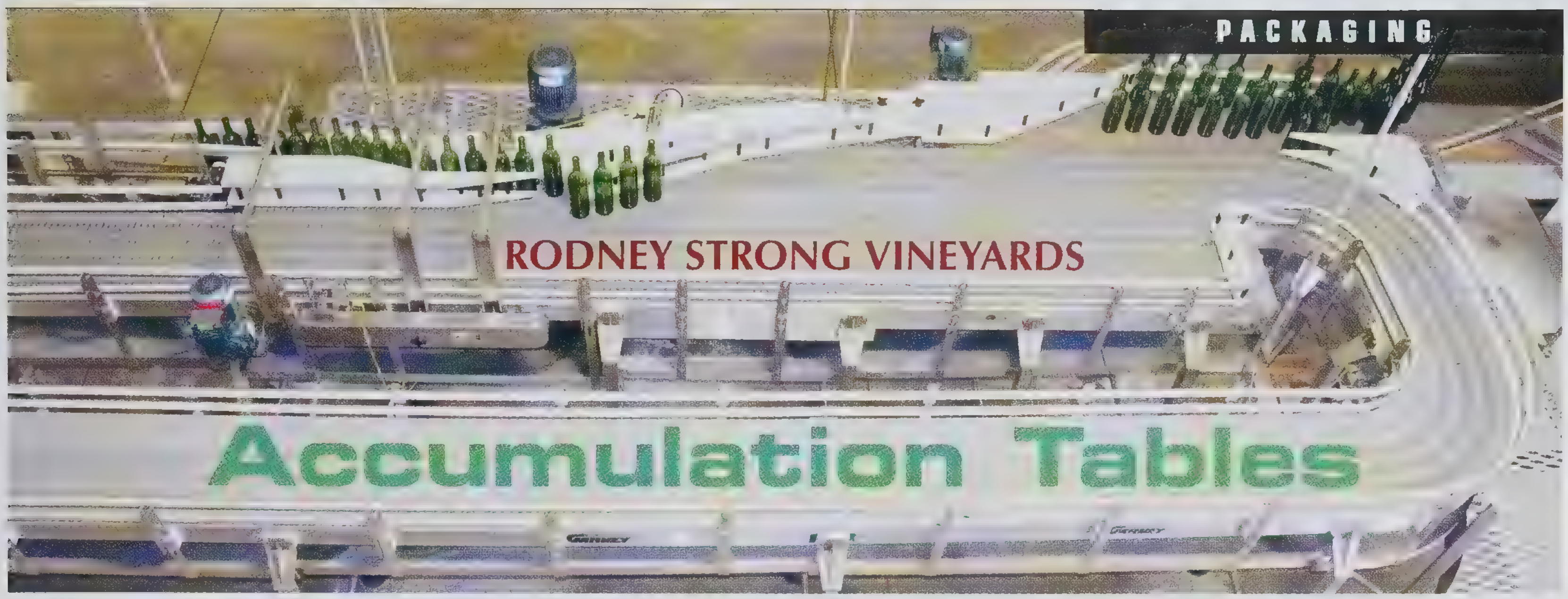


The first Garvey Infinity accumulation table retains a full supply of empty bottles (see cover) so the filler never runs out. If the upstream uncaser stops (on right, out of photo), the accumulator table (1,000 bottle capacity) can feed the filler until the uncaser delivers more bottles. Bottles enter the table from right, exit onto conveyor [top-left] to reach the filler. The Garvey conveyor chain has high-precision, plastic integrated sliding surface allowing for smooth bottle transfers and elimination of down bottles.

RODNEY STRONG VINEYARDS

Accumulation Tables

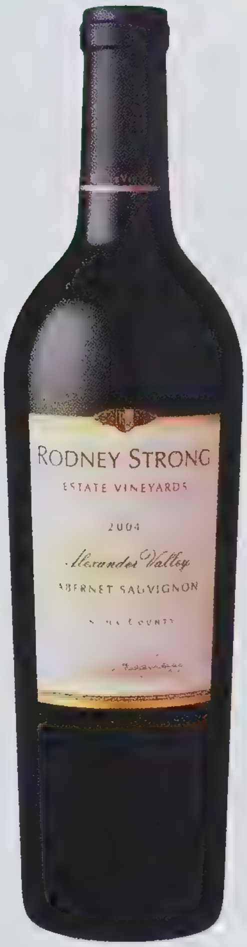
Overcome unstable tapered bottles

BY Ben Garvey, Garvey Corporation

Tapered bottles are popular with consumers, but they offer unique challenges on a bottling line. The bottles are wider at the shoulder than they are at the bottom and have a tendency to tip where normal straight-wall bottles travel easily on conveyors and traditional accumulation tables.

Rodney Strong Vineyards (Windsor, CA) installed a new bottling line in 2006 to allow filling and packing of the bottles (often called reverse tapered). Material handling technology was a very important and critical part of the engineering process when designing the new bottling line components.

"We were setting the line up to run tapered bottles at 180 per minute and it just made sense to use the Garvey Infinity tables. Last-in first-out tables do not work for tapered bottles," says Jim Magness, Rodney Strong Vineyards facility manager.



Three Garvey Infinity accumulation tables were installed to accumulate and single-file tapered bottles. Other accumulation systems, such as a bi-directional conveyor, cannot handle tapered bottles because they rely on back-pressure and right angle transfers to move bottles between conveyors. The Garvey Infinity accumulates and side transfers on a moving surface with zero back-pressure.

"You can't have more than about six to eight tapered bottles accumulate on a bi-directional conveyor or they start to fall," adds Magness. "With the Infinity tables, the bottles do not back up."

"The theory behind Garvey Infinity Accumulation is simple," explains Bill Garvey, president of Garvey Corporation, Blue Anchor, NJ. "We eliminate the all too common belt-sander effect where conveyor chains run underneath stationary bottles. We allow bottles to travel continuously around our patented accumulation loop with zero pressure and then single-file on demand using a pneumatically controlled outfeed gate."

Bottles running on an Infinity Accumulation table always move in one direction, allowing for minimal bottle contact. This decreases label damage, allows for higher outfeed rates, and reduces noise. The table

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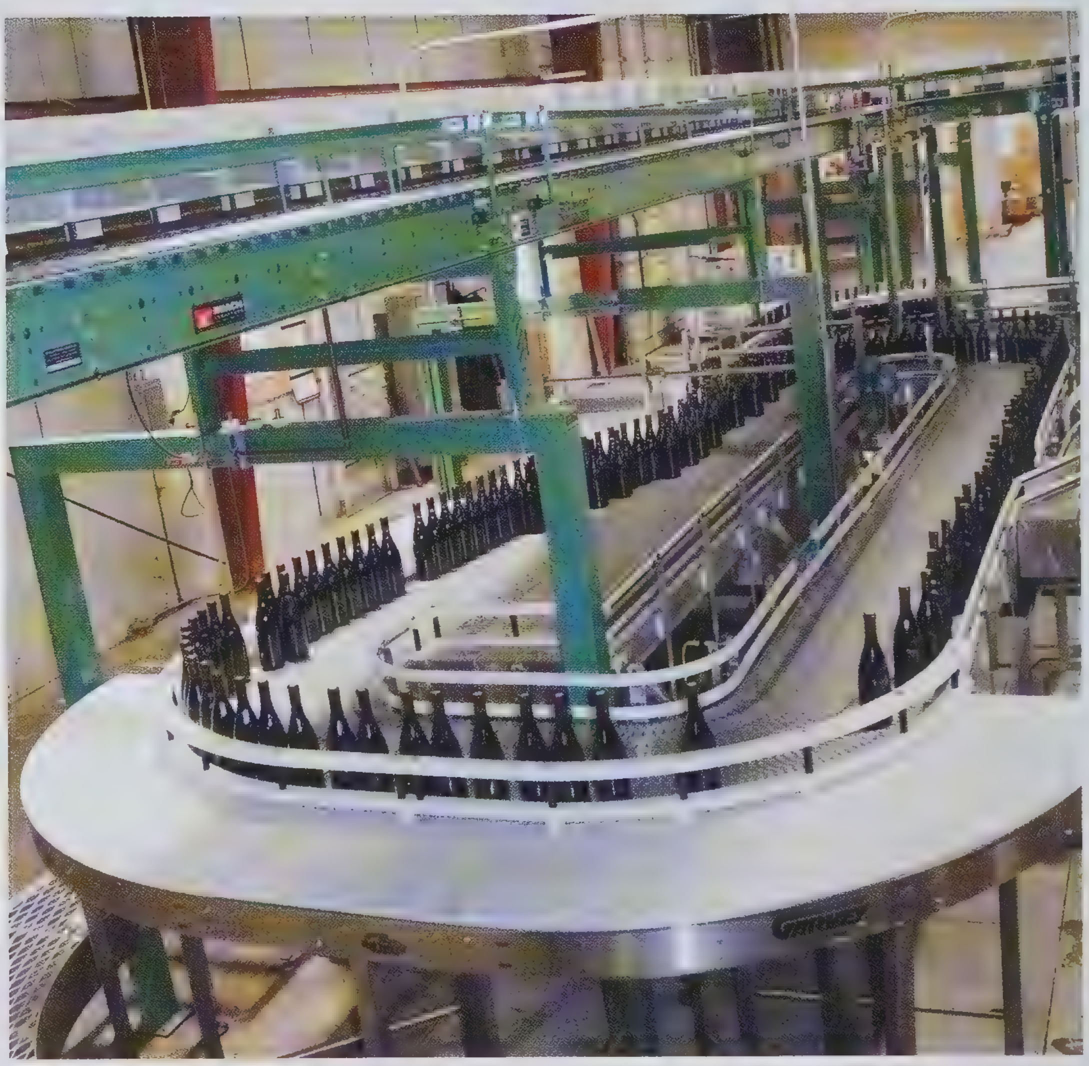


This Garvey Infinity accumulation table allows the filler to keep running if the labeler is down. It accepts up to 1,245 bottles from the filler, and feeds them single-file to a conveyor leading to the labeler.

resembles an oval-shaped race track and incorporates an innovative loop system. The table does not use a traditional return chain underneath the entire conveyor, but rather returns chain immediately back to the tail section. This minimizes chain quantities and makes it easy to clean.

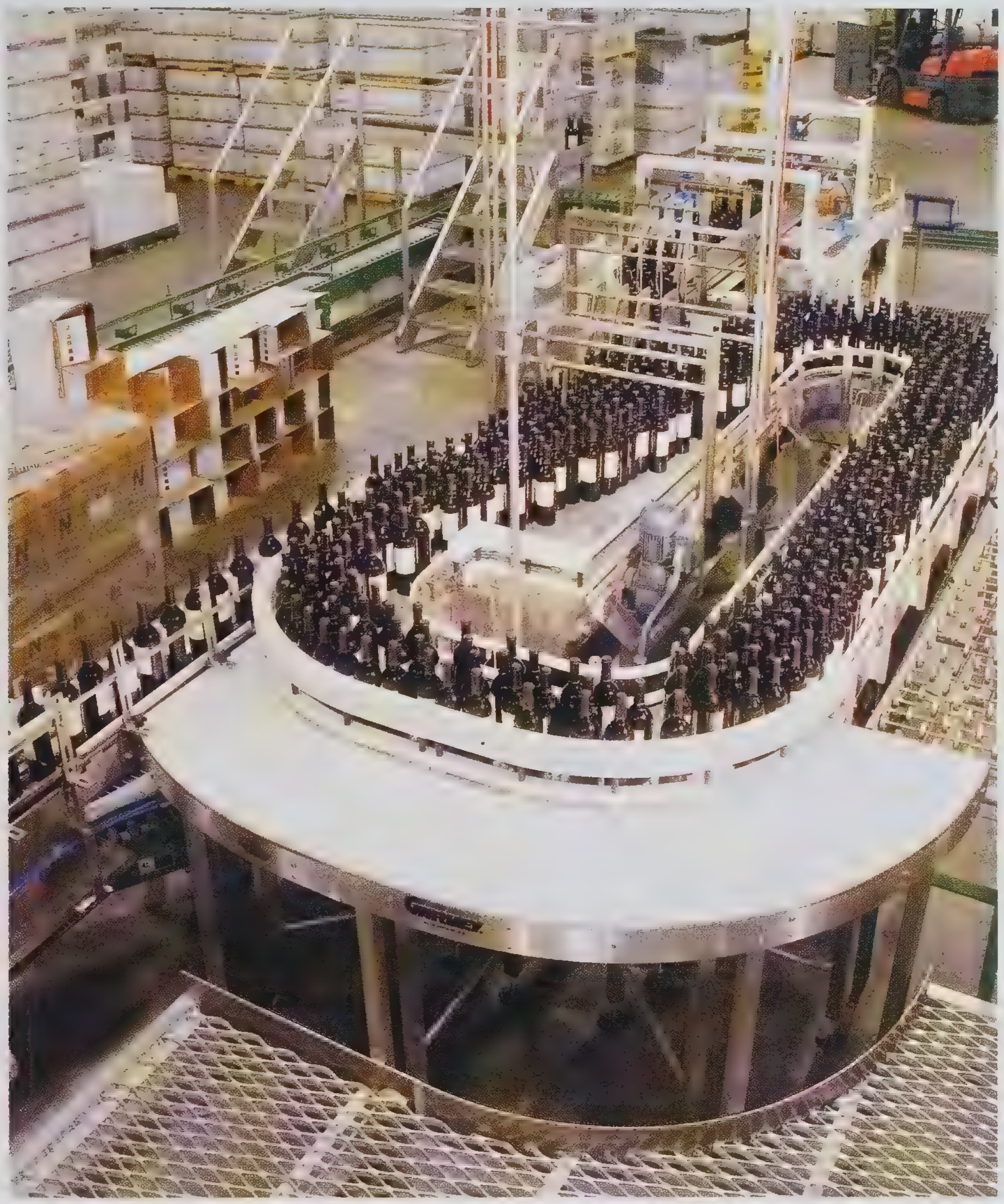
As bottles are single-filed, they flow smoothly out of the accumulation loop with the aid of Garvey's patented Slow Down Lane, a slower-moving conveyor that helps prevent bottle turbulence near the outfeed, making tapered bottles run just like straight-wall bottles.

Garvey challenges the conventional wisdom that highly efficient and effective packaging lines require miles of installed mass-flow conveyors stringing between machine centers. Those types of conveyors have a small percentage of available accumulation space, but Garvey Infinity tables utilize 90% or more of the available space for accumulation, shrinking the overall length of the line in the process.

Like the age-old adage "a chain is as strong as its weakest link," a bottling line without accumulation is like a chain waiting to break. Accumulation adds value by decoupling the efficiencies of each machine so when a malfunction occurs on one machine, other machines are unaffected. Constraint theory tells us that every production line has a single bottleneck that limits its maximum output capacity.

Rodney Strong Vineyards and Garvey identified the 180 bpm Bertolaso filler/corker as the limitation and made preventing downtime on it a high priority. The other machines operate at slightly higher speeds in order to empty or refill the accumulation tables. (Maximum productivity of the previous bottling line was 120 bpm.)

The first Garvey Infinity accumulation table is installed between an ABC



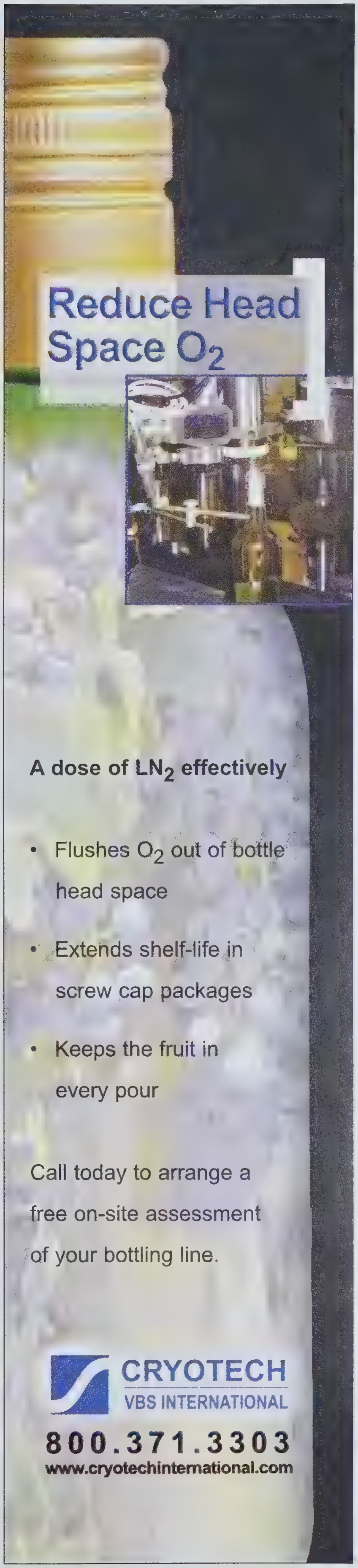
The third accumulation table collates bottles into three lanes to feed the casepacker without backpressure, an important advantage to running tapered bottles. It also has the added benefit of additional accumulation (600 bottles) to protect the rest of the bottling line against downtime on the casepacker.

uncaser and the Bertolaso monobloc (cleaner/filler/corker/capper). The uncaser feeds the Infinity table at speeds of up to 240 bpm and the Infinity can hold up to 1,000 750ml bottles, allowing for a maximum downtime of 5.5 minutes on the uncaser before the monobloc runs out of empty bottles. This keeps a sustained population of bottles on the accumulation table upstream from the constraint at all times.

A second Garvey Infinity accumulation table is placed between the Bertolaso monobloc and the Robino & Galadrino (R&G) capsuler. Unlike the first table, which is normally full, the second Infinity table is normally empty and waiting to accept product during downtimes on the R&G capsuler or the Krones labeler. This table gives the filler/corker the ability to keep operating even if the rest of the line is stopped for up to seven minutes.

The second Infinity table holds up to 1,245 bottles. Garvey added capacity of an additional 245 bottles, so once a bottle begins the filling process, the Infinity will always have capacity to accept it.

A third Garvey Infinity accumulation table is placed between a Krones



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labeler and a Standard-Knapp case packer. This Infinity outfeeds the product in three distinct rows directly into the case packer. It has a maximum capacity of 600 750ml bottles and protects upstream machines from case packer downtime for up to 2.5 minutes.

Most tapered bottling requires operators to stand up fallen bottles feeding into their automated case packer. Once bottles are filled, capsuled, labeled, and ready to be packed, the last thing you want is rework on them. When a tapered bottle falls, it tends to take a few other bottles with it, creating huge issues at the case packer.

Garvey's multi-lane Infinity table eliminates the need for additional operators in that area. "There are other ways to feed a case packer," notes Tony Palandrani (Garvey Pacific sales director). "Why spend money on a laner and an accumulation table when the Garvey Infinity can do them both for a fraction of the cost?"

Changeover between different bottle styles was another concern. Each Infinity table can be reconfigured for another size in less than five minutes with 100% repeatability. Changeover adjustment on the first two Infinity tables is done by loosening a series of hand knobs and moving a plastic guide into position using a bottle as a guide. No tools are required and the design is flexible enough to accommodate future bottle shapes within a predefined range determined at the start of the project.

Changeover for the third Garvey table, which divides bottles into three lanes for the case packer, is accomplished by loosening hand knobs and sliding stainless steel dividers into positions marked on an overhead channel.

Pack stations are also incorporated into the design of the second and third Garvey Infinity tables, allowing for manual loading or unloading of bottles

RODNEY STRONG WINES GOING INTO TAPERED BOTTLES

Wine	Quantity (cases)
IN 2008:	
Alexander's Crown Cabernet Sauvignon	2,850
Alden Cabernet Sauvignon	600
Alexander Valley Cabernet Sauvignon	11,500
Sonoma County Merlot	40,000
Sonoma County Cabernet Sauvignon	41,000
IN 2009:	
Knotty Vines Zinfandel	18,000

Small quantities of Sonoma County Cabernet Sauvignon Reserve, and Symmetry Red Meritage blend, are packaged in heavyweight tapered bottles.

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during quality assurance tests, unlabeled "shiner" runs, or hand-packing.

Rodney Strong Vineyards uses the three Garvey Infinity accumulation tables to safely accumulate tapered bottles, but also was able to shorten the overall length of the bottling line, eliminate the need for a additional laning device, and make hand-packing easier. ■

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Wineries continue to struggle with direct-to-consumer shipping laws

BY Robert A. Cocchia,
and Megan Duma Meacham,
McKenna Long & Aldridge, LLP
San Diego, CA

Wineries across the nation are fighting for the right to gain access to the lucrative, and readily accessible, direct-to-consumer shipping market. Where permitted (by state wine laws), wineries are able to sell and ship their wines directly to consumers, by-passing wholesalers and retailers, which results in lower prices to consumers and better profit margins for the wineries.

For the small to mid-size winery without the distribution capabilities of larger wineries, this market is not only lucrative, it is critical. Although the shipping process is straightforward, the potential legal implications are varied, and in some circumstances — depending on location of the winery and the consumer — direct-to-consumer shipping is illegal.

Take the following example: a consumer from Indiana visits California. This consumer is an oenophile[1] and wishes to buy wine directly from local wineries. During his tour of California, he visits a winery in Napa Valley. This particular consumer enjoys the winery's award-winning Syrah, and attempts to join their wine club in order to receive wine shipments directly to his home. However, the consumer (and the winery) has one problem: Indiana's law makes it burdensome for the winery to ship their wines directly to him, so they are forced to forego that purchase.

This problem is not unique to Indiana consumers. Many states have various restrictions that result in a patchwork of regulations prohibiting or impeding wineries from shipping their wines directly to consumers living within those states.

One might have thought the problem was solved in 2005, when the U.S. Supreme Court ("Court") held, in *Granholm v. Heald* ("*Granholm*"), that it was unconstitutional to allow in-state wineries to ship directly to consumers, while at the same time forcing out-of-state wineries to distribute their wines through in-state wholesalers and in-state retailers (otherwise known as the "three-tier" system). Unfortunately, *Granholm* left it up to the individual states to decide how they would comply with the ruling.

After *Granholm*, many states had to rethink (and rewrite) their liquor laws. Some states opened up their borders and allowed wineries to apply for licenses to ship wine directly to consumers within their states, some states ceased all direct-to-consumer shipping (from both in-state and out-of-state wineries), and some states employed legislative schemes that appeared non-discriminatory, but effectively precluded out-of-state wineries from direct shipping.[2]

This article discusses the practical implications of *Granholm* for wineries, outlines legislative tactics, and discusses how judicial opinions regarding these legislative roadblocks differ around the U.S.

Granholm changes state regulations: 21st Amendment and the Dormant Commerce Clause

In *Granholm*, two small wineries, joined by Michigan and New York residents ("Wineries"), challenged statutes from Michigan and New York that allowed in-state wineries to ship directly to consumers,[3] while denying out-of-state wineries the same opportunity. The Michigan statute was a complete ban on direct-to-consumer shipping privileges for out-of-state wineries. The New York statute only allowed direct-to-consumer shipping if the winery established a physical presence in New York through a branch office or warehouse.

The Wineries sued the Michigan and New York law enforcement agents ("Officials") in their official capacities. The Michigan Beer & Wine Wholesalers Association ("Wholesalers") intervened in the matter to protect their business interests in forcing all out-of-state wine through the three-tier system. The Officials and Wholesalers argued that the 21st Amendment afforded a state complete power to regulate and control the distribution of alcohol within its borders. The Supreme Court disagreed and held that the 21st Amendment, and the authority of states to regulate the distribution of alcohol, was still subject to the Dormant Commerce Clause.

The Dormant Commerce Clause is a rarely utilized (except in direct shipping laws) legal principle based on the Commerce Clause (U.S. Constitution Article I § 8). The Commerce Clause grants Congress the power to pass legislation that affects interstate commerce.

As a judicially created counterpoint, the Dormant Commerce Clause (also known as the Negative Commerce Clause) forbids individual states from enacting legislation that discriminates against or unduly burdens interstate commerce. In other words, since Congress has the power to make laws that affect interstate commerce, states do not. Once the challenger of a state law meets the burden of showing that it is discriminatory, the proponents of the law must show that it is necessary to serve a legitimate interest.

Here, the Wineries had little difficulty meeting their burden to prove the statutes discriminatory because there was clear protection of in-state wineries and clear burdens to out-of-state wineries. This triggered the Court's Dormant Commerce Clause analysis. The burden then shifted to the Officials and Wholesalers to prove that the discriminatory statutes were necessary to serve a legitimate interest, which could not be achieved by less discriminatory means.

The Officials proposed many "legitimate interests," including keeping alcohol out of the hands of minors, facilitating tax collection, facilitating orderly market conditions, protecting public health and safety, and ensuring regulatory accountability. The Court disagreed with all of these rationales.

The Court dismissed the arguments regarding minors as unlikely, stating that minors would not wait weeks for a shipment of wine when there were more "direct means" of achieving "instant gratification." The Court dismissed the tax and accountability issues by relying on advances in technology and communications to ensure the state's ability to control distribution and collect excise taxes. Finally, the Court found that the interest of facilitating market conditions and protecting public health and safety could be achieved by less restrictive means.

The Court ultimately struck down the statutes because they violated the Dormant Commerce Clause. This left Michigan, New York, and other similarly situated legislatures three options: 1) allow out-of-state wineries to ship directly to their consumers under the same terms as in-state wineries; 2) take away the ability of in-state wineries to ship directly to consumers so there is no discrimination;[5] or 3) enact various "requirements" as prerequisites to obtaining licenses, which heavily burden, or effectually eliminate the ability of out-of-state wineries to ship directly to their consumers.

The third option has led to further litigation and various judicial opinions regarding the constitutionality of these new types of restrictions.

Attempts to circumvent *Granholm*

For many states, alcohol control laws (with regard to wine) have been the subject of numerous lawsuits in the post-*Granholm* environment.[6] Despite *Granholm*'s holding, some states failed to change their discriminatory laws. These states had the option of either allowing out-of-state wineries to ship directly to their consumers or prohibiting all direct shipping.[7] Other states reworked their laws, making it nearly impossible for out-of-state wineries to legally ship to their consumers.

Influenced by wholesalers' well-established lobbyists, state legislatures used many different ploys to slow the entry of out-of-state wineries, particularly those on the west coast, into the direct shipping market. Indiana, for example, enacted a law including many roadblocks. In the case of *Baude v. Heath*, the District Court for the Southern District of Indiana approved some of the restrictions and struck down others. In many other districts around the U.S., similar decisions were made. When a state's laws are particularly restrictive,

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some wineries do not even bother shipping to their customers. In this way, wholesalers are getting exactly what they want.

Baude v. Heath: Indiana's bad blend of restrictions

In *Baude v. Heath,* the parties took their usual fighting stances. A small winery, joined by Indiana wine connoisseurs ("Wineries"), sued state officials ("Officials") for violating the Dormant Commerce Clause. Rushing to intervene, the Wholesalers of Indiana ("Wholesalers") took the side of the Officials, defending the sanctity of the regulations. The Wineries challenged the restrictive provisions, and the court's decision reflects the navigation of these laws.

Face-to-face transaction requirements

One of the challenged provisions of Indiana's new legislation was the requirement that the winery and the consumer have a face-to-face meeting, where various requirements had to be met, before the winery could ship to that individual. The Officials argued that this meeting was necessary to verify that the consumer was over 21 years old. The Wineries contended that this restriction effectively prevented them from selling wines directly to consumers, because those consumers would have to incur the expense and burden of traveling hundreds of miles to reach the majority of American wineries, which are located in California, Oregon, and Washington.

The court ultimately looked to *Granholm* for guidance, recognizing that the face-to-face requirement (which, upon first glance, does not appear discriminatory), discriminated disproportionately in effect on out-of-state wineries. The court likened the requirement to the New York statute in *Granholm* that required a physical presence in the state in order to ship wine directly to consumers.

While the Court did recognize the importance of protecting minors from underage drinking, it nonetheless made it clear that the Officials and the Wholesalers had not met their burden of proving there were no less discriminatory alternatives to a face-to-face transaction. The Court ultimately held that the law was unconstitutional.

A split of decisions exists in the federal district courts (trial courts) and federal circuit courts (appellate courts) around the U.S, regarding the face-to-face transaction requirement. The First Circuit (the federal appellate court for the state of Maine) upheld a face-to-face transaction requirement, finding that the Wineries did not meet their burden of proving discriminatory effect. The Western District of Kentucky struck down the face-to-face requirement as unconstitutional because it "amounts to differential treatment of in-state and out-of-state economic interests that benefit the former and burdens the latter."

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Because these provisions were enacted post-*Granholm*, the U.S. Supreme Court did not address these types of restrictions in its opinion. The Supreme Court only agrees to hear less than 2% of the cases that come to it on appeal. Thus, it is unlikely that it will hear another case regarding direct shipping issues, especially for such intricate licensing laws. It is more probable that state legislatures will be influenced by the respective lobbying groups (wholesalers versus wineries).

For example, states with a small or non-existent wine industry will favor wholesale protection measures, while states with an established or growing local wine industry may allow direct shipping. It will depend on who is gathering more support for the laws — the wholesalers or the wineries. For states that lack a viable wine industry, the wineries' allies are the consumers and the retailers. They may be the only arsenal available to advocate in favor of direct shipping.

No existing wholesaler licenses

In a not-so-subtle attempt to block shipments from popular West Coast wineries, Indiana's legislation also prohibits a winery from obtaining a license to ship wine into Indiana if that winery presently holds a wholesale license in *any* state or has distributed any wine through a wine wholesaler in Indiana within the preceding 120 days.[14]

States such as "California, Oregon, and Washington provide wholesale privileges to all wineries as part of their basic licensing procedures."[15] Wholesalers argue that this requirement is necessary to protect the three-tier system.

Granholm, however, reasoned that out-of-state wineries with a small production should be allowed to ship directly to consumers because they do not make enough wine for it to be profitable for a separate wholesaler to market their product into the commercial channels of other states.

Wholesalers have taken the reverse argument as true, arguing that if a winery already has a wholesaler license, they should not be allowed to directly ship their wines into Indiana. However, this argument fails for two reasons. First, simply because the winery has a wholesale license in one state does not mean that it can reach the markets of other states. Second, forcing a winery to continue to use the three-tier system adds "two extra layers of overhead [increasing] the cost of out-of-state wines."[16]

The Indiana legislature was aiming these regulations at restricting imports from wineries on the west coast and guarding the bank accounts of Indiana's wholesale business. The *Baude* court agreed, explaining that "by the simple expedient of barring the issuance of a Direct Wine Seller permit to wineries with wholesale privileges, the Indiana General Assembly has effectively prevented most out-of-state wineries from obtaining such a permit.

"It is hard to imagine that the legislatures who drafted the wholesale pro-

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hibition, or at least the lobbyist who assisted them, were unaware of this."[17] *Baude* ultimately held the "no pre-existing wholesale license provision" unconstitutional as violating the Dormant Commerce Clause because it effectually discriminates against out-of-state wineries.

Capacity caps

Indiana's requirement also denied licensing of any winery that produced more than 500,000 gallons of wine or that was the parent, subsidiary, or affiliate of another entity manufacturing any alcoholic beverage. This provision, like the pre-existing wholesale license provision, has the effect of discriminating against large producers in California, Oregon, and Washington who have the capacities to produce wine in sufficient quantities.

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California produces over 700 million gallons of wine annually, followed by New York, producing just under 30 million gallons. California has more than 2,000 producing wineries, many with capacities over 500,000 gallons. Indiana produces only a little over 500,000 gallons of wine in the entire state, so no one winery would be prohibited from direct-to-consumer shipping, due to this regulation.[18]

Consequently, a large number of California wineries are effectively discriminated against by the law, which prohibits them from shipping to Indiana if they have the capacity to produce more than 500,000 gallons, especially if not one in-state winery has such a production capacity. The Wineries in *Baude* did not challenge this provision, but other wineries have argued that capacity caps are unconstitutional.[19]

Aggregate limits

Under another section of Indiana's law, no winery could ship more than 216 liters of wine to any customer, and no more than 27,000 total liters within the state of Indiana. This provision may not be obviously discriminatory, but it plainly adds more logistical requirements (which means additional expense) to the wineries' cost of operations, and may have a discriminatory effect.

The law may force consumers to purchase wines from local wineries to supplement the amount of wine they are allowed to purchase from out-of-state wineries. The wineries in *Baude* did not challenge the aggregate-limit provision; however, another winery unsuccessfully asserted a challenge to the aggregate-limit requirement in a Kentucky statute.[20] There, the court refused to find the aggregate limit discriminatory on its face, in effect, or through the legislative intent.

Variety of remedies

Once a court has determined that a particular regulation is unconstitutional, the next step is to fashion a remedy for the violation. The remedy the court chooses may be as dangerous for a winery as the initial decision. The court may choose to strike down the

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discriminatory provision and allow out-of-state wineries access to direct shipping. In other cases, as noted above, the court may await legislative action before deciding on a remedy.

Most problematic for the wineries, the court may take away the ability of in-state wineries to ship directly to consumers, eliminating the discriminatory effect. Each of the three parties involved — Wineries, Officials, and Wholesalers — proposes a different remedy.

Extension of the law: Wineries win

In *Baude*, the Wineries urged the court to extend the law, thereby allowing them to ship directly to consumers within Indiana.[21] They argued that when a law extends benefits to some and denies them to others, the correct remedy is "extension, rather than nullification." The *Baude* court ultimately agreed, but decided to inflict as little damage as possible on the statutory scheme by striking only the two provisions it found unconstitutional: the pre-existing wholesale provision and the face-to-face transaction requirement.

Other courts have agreed with this limited involvement approach, striking only those portions it finds unconstitutional.[22] This resulted in a small victory for the wineries, but it may be short-lived due to legislative action or the results of appeals.[22]

Waiting game: Staying enforcement until the Legislature acts

The Officials in *Baude* requested that the court stay its decision and await the General Assembly's next meeting. The Officials opted for a "minimum damage" approach to the statutory scheme, urging the court to avoid drastic changes. *Baude* did not follow this approach, but other courts have. In an Oklahoma case, *Action Wholesalers Liquors v. Oklahoma Alcoholic Beverage Laws Enforcement Commission*, the court stayed its decision pending a gathering of the General Assembly and warned that if the legislature did not act, it would be forced to strike down the statute, which created an exception to the three-tier system in favor of in-state wineries.[25]

Nullification: Be careful what you ask for

On the other end of the spectrum, the Wholesalers in the Oklahoma case urged the court to take away the in-state wineries' privileges to ship directly to consumers. This remedy, they argued, would level the playing field and clear the statutory scheme of its discriminatory effect. It would also force the in-state wineries to channel their wines through wholesalers, thereby creating more business for the wholesale industry.

This remedy is the most dangerous for wineries, because it eliminates all direct access to consumers, ultimately increasing wine prices and lowering demand for wines. This is particularly dangerous for small and medium-size wineries that depend on the direct-to-consumer shipping market to sell their wines.[26]

Many courts have hinted to the legislatures that if they wish to exclude out-of-state wineries, they cannot make exceptions to the three-tier system (allowing their in-state wineries to ship directly when out-of-state wineries have to go through the three-tier system). "The logical corollary to evenhanded permissiveness is evenhanded restrictiveness — a State may choose to ban direct shipment of wine and require all wineries to operate within the three tiers."[27]

Recently, a court in Arkansas upheld a statute in which the legislature took away an in-state winery's ability to ship directly to retailers.[28]

Future of wine litigation

As states struggle to comply with *Granholm*'s holding, wineries continue to pursue constitutional equality. Currently, suits are pending in Massachusetts, Missouri, and Arizona.[29] At the trial level, the wineries are challenging pre-existing wholesale contract prohibitions, aggregate limits, and statutes that fail to treat in-state and out-of-state wineries equally. Further, retailers are pushing to widen the scope of *Granholm* to encompass direct-to-retailer shipping.[30]

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The legislation and judicial opinions relating to these issues are ever-changing and will form the future landscape of distribution in the wine and other alcoholic beverage industries. The outcome will depend on the tenacity and wherewithal of wineries, related associations, and industry groups who have to lobby, challenge these laws in trial courts, and see the litigation through to the appellate levels. ■

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END NOTES

1. Wine connoisseur.
2. States are still grappling with whether to open their borders and allow direct shipping or employ legislative roadblocks. The Florida legislature recently allowed three bills to expire without being enacted that would have effectively prohibited many small wineries from entering the direct-to-consumer shipping market.
3. In-state wineries were granted permission to have licenses to ship directly to consumers that did not apply to out-of-state wineries. Michigan requires all beer and intoxicating liquors to pass through the three-tier system.
4. *Granholm,* 544 U.S. at 489–90.
5. This solution threatens the purpose behind the wineries' movement to free shipping of wines. If a state opts to take away the in-state winery's ability to ship directly to consumers, the price of local wine increases because it is forced through the three-tier system. In the three-tier system, adding a wholesaler to the chain of distribution increases overhead. Most west coast wineries depend on a growing number of American wine connoisseurs to purchase their products, and increasing the price of local wines hinders that goal, as all wine becomes more costly.
6. States including Michigan, New York, Maine, Kentucky, Texas, Tennessee, Rhode Island, Oklahoma and Pennsylvania.
7. When legislatures have yet to act, some courts stay their rulings, awaiting a legislative reaction to *Granholm. Action Wholesale Liquors v. Oklahoma Alcoholic Beverage Laws Enforcement Commission,* 463 F.Supp.2d 1294, 1306-07 (W.D. Okla., Nov. 15, 2006).
8. *Baude v. Heath* was decided in August, 2007 and is on appeal to the Seventh Circuit. 2007 WL 2479587 (S.D. Ind., August 29, 2007). See www.familywinemakers.org/ (last visited February 12, 2008).
9. At this face-to-face transaction, the winery is responsible for gathering the consumers' names, telephone number, proof of age (by a state issued driver's license) and a sworn statement that they are Indiana residents, over twenty-one years of age, and intended the wine only for personal consumption. Ind. Code Sec. 7.1-3-26-6 (1),(4), and Sec. 7.1.3-26–9. This provision also prohibits sending wine as a gift, because the individual cannot attest it is for personal consumption.
10. "[W]ineries exist in states other than those neighboring Kentucky, [each] winery's products are distinctive, and many of the highly desirable wines come not from Tennessee and Indiana, but from California, Oregon and Washington." *Cherry Hill Vineyards LLC v. Hudgins,* 488 F.Supp.2d 601, 617 (W.D. Kent., Dec. 26, 2006).
11. Indiana also has strict requirements for the labeling and logistics involved in shipping. The label on the shipping container requires a statement that the delivery was only made upon

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obtaining a signature from a recipient twenty-one years or older. The winery also had to instruct the carrier to verify the recipient's age at the time of delivery. These requirements lessened the Court's concerns about minors obtaining wine through direct shipping.

12. *Cherry Hill Vineyard, LLC v. Baldacci*, 2007 WL 2949312 at 7 (Slip Copy).

13. *Huber Winery v. Wilcher*, 488 F.Supp.2d 592, 599-600 (W.D. Kent, Aug. 21, 2006).

14. This clearly protects the wholesalers "from any substantial encroachment upon their hold over the wholesale wine market in Indiana." *Baude*, 2007 WL 2479587 at 2 (Slip Copy).

15. *Baude*, 2007 WL 2479587 at 2 (Slip Copy).

16. *Granholm*, 544 U.S. at 474.

17. *Baude*, 2007 WL 2479587 at 17 (Slip Copy).

18. These statistics are available at the National Association of American Wineries' website at www.wineamerica.org/newsroom/data.htm (last visited 12/31/07).

19. See *Cherry Hill Vineyards LLC v. Hudgins*, 488 Fupp.2d 601, 613 (W.D. Kent., Dec. 26, 2006) and *Family Winemakers of California v. Jenkins*, No. 1:06-cv-11682 (D. Mass., pending).

20. *Cherry Hill Vineyards LLC v. Hudgins*, 488 F.Supp.2d 601 at 614 (W.D. Kent., Dec. 26, 2006) (holding that a two-case limit does not discriminate against out-of-state wineries.)

21. *Baude*, 2007 WL 2479587 at 28 (Slip Copy).

22. *Huber Winery v. Wilcher*, 488 F.Supp.2d 592, 597 (W.D. Kent., Aug. 21, 2006).

23. The legislature may choose to force all wine (in-state and out-of-state) through the three-tier system.

24. *Huber Winery v. Wilcher* was not appealed by either the Winery or the State, however the Kentucky Wine and Spirits Wholesale Association has tried to independently appeal to the Sixth Circuit Court of Appeals. Initial briefing was submitted in late February 2008. As of June 5, 2008, the Sixth Circuit had not decided whether the wholesaler, alone, may appeal.

25. *Action Wholesalers Liquors v. Oklahoma Alcoholic Beverage Laws Enforcement Commission*, 463 F.Supp.2d 1294, 1306–07 (W.D. Okla., Nov. 15, 2006).

26. For an economic analysis regarding the effects of the three-tier system on alcoholic beverage pricing, see *Strange Brew: Alcohol and Government Monopoly* by Douglas Glen Whitman (The Independent Institute 2003).

27. *Jelovsek v. Bresden*, 482 F.Supp.2d 1013, 1019 (E.D. Tenn., Mar. 30, 2007).

28. *Beau v. Moore*, 2007 WL 3231890 (Slip Copy, E.D.Ark, Nov. 1, 2007).

29. Dist. Mass.: *Family Winemakers of California v. Jenkins*, No. 1:06-cv-11682 (attacking capacity caps and preexisting wholesale contract prohibition). E.D. Mo.: *Rafanelli Winery & Vineyard v. Missouri Div. of Alcohol and Tobacco*, 2007 WL 28437 (Slip Copy, Jan. 3, 2007). Dist. Ariz.: *Black Star Farms v. Morrisson*, 2:05-cv-2620-PHX-MHM (challenging aggregate amounts and direct access to retailers). S.D. of Ind.: *Baude v. Heath*, 2007 WL 2479587 (Slip Copy, August 29, 2007.)

30. In *Costco Wholesale Corp. v. Hoen*, No. 06-35543 (D.C. No. CV-04-00360) the Ninth Circuit recently overturned the District Court's holding regarding various laws that affect a retailers ability to market, ship and distribute wine and beer products. At the District Court level, the regulations were held to violate the dormant commerce clause and anti-trust laws. The Appellate Court disagreed and upheld seven of the laws as Washington's valid exercise of rights under the Twenty-First Amendment, and struck down two laws as violating anti-trust regulations. The Ninth Circuit recently denied the wineries' request to reconsider its decision. This leaves wineries with two options: 1) Appeal to the Supreme Court, or 2) Hire a lobbyist to help change the law. This body of law is developing quickly, and is beyond the scope of this article.

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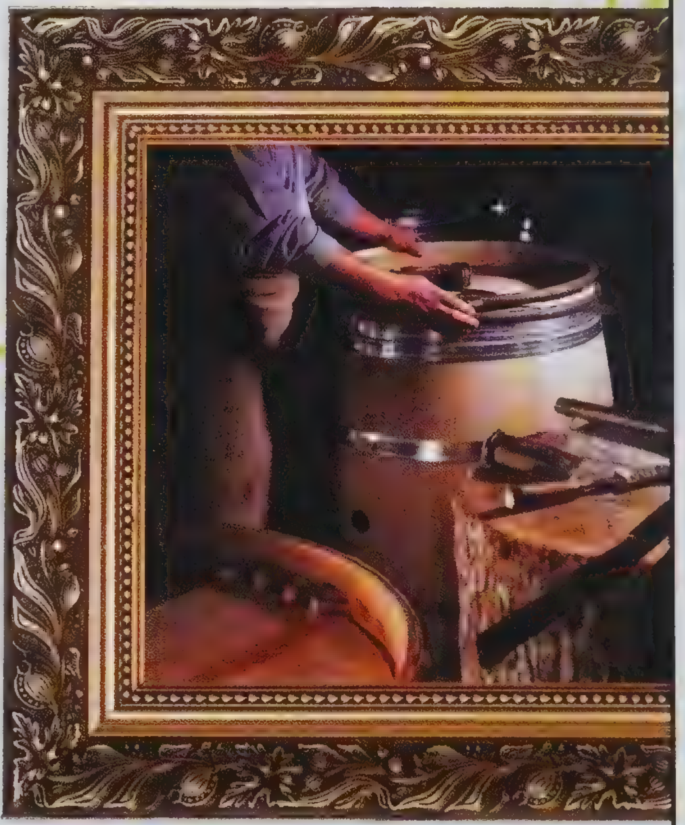


HACCP PLAN

Winemakers check sulfur-like off odors

BY Bruce Zoecklein,
Virginia Tech, Blacksburg, VA

A systemized, standard methodology such as HACCP (Hazard Analysis and Critical Control Points) can aid grape growers and winemakers to reach quality goals. HACCP plans can be written in general terms or can be created to focus on specific grape growing or winemaking issues. The following is a review directed to the optimum management of sulfur-like off odors (SLO).

An HACCP plan for the evaluation of sulfur-like off odors is designed to understand viticultural and winemaking practices that may impact the production of these compounds and how they may be managed. SLO have been around for the 8,000 years of wine production. An HACCP plan may not resolve all SLO concerns, but may provide a much greater understanding of cause and effect, aiding management.

SLO can be derived from several sources and are members of the following chemical compounds:

- H_2S;
- Thiols or mercaptans: R-S-H;
- Disulfides: R-S-S-R;
- Thioesters: R-S-CO-R; and
- Fatty acids, 3-methyl-indole and 2-amino-acetophenone.

The many forms of SLO have different sensory characteristics and, generally, low to very-low sensory thresholds. They can be classified based upon their chemical make-up, as illustrated above, reactivity, or boiling points. The light or "low boilers" are produced during and post-fermentation. Because of their low volatility, their concentration may be lowered by aeration or sparging, and some like H_2S and mercaptans react with copper.

The heavy, or high-boiling-point, compounds also have a significant role in sensory defects. They are produced by yeast metabolism during fermentation, not post-fermentation and remain stable in the wine after fermentation. High boilers cannot be removed by aeration due to their limited volatility, and they do not react with copper. Thio esters are odorless, but can undergo hydrolysis, or breakdown, to release thiols, thus contributing to disagreeable odors.

> *"Genius is like fleet of foot, method is the right path.*
> *Fleetness of foot on the wrong path never leads to knowledge."*
>
> *— Francis Bacon*

In addition to the general incidence of SLO in wines, several important sulfur-containing compounds are gaining attention. Dimethyl sulfide (DMS) is believed to be synthesized by yeast from cystine, cysteine, or glutathione and derived from methyl mercaptan (glutathione is a sulfur containing polypeptide currently receiving attention due to its ability to act as an antioxidant). With aroma descriptors of truffle and quince, it is thought by some to have little or no direct negative aroma impact. However, DMS can modify the overall aroma and taste profile.

Diethyl sulfide (DES) is a high-boiler-type SLO that has a garlicky, rubber-type odor. DES can increase post-fermentation, is stable during ageing, and does not react with copper. As such, compounds like DES pose a significant potential problem, justifying a proactive approach such as an HACCP plan.

STEP 1. CREATE A FLOW DIAGRAM FROM VINE TO GLASS

A production outline (Figure I) can be general or very detailed, depending on the degree of specification desired. HACCP allows growers and winemakers to customize a quality management system tailored entirely to their production practices and philosophy.

STEP 2. IDENTIFY THE CRITICAL CONTROL POINTS OF SLO PRODUCTION

A Critical Control Point (CCP) is any point in the production scheme that is believed to impact production and management of SLO (Figures II and III).

The basic premise behind the development of CCPs is fundamental. In the development of an HACCP plan, each viticultural and winemaking element should be listed and actions formulated.

In the complex world of SLO production this plan would allow growers and winemakers to understand steps and practices that are critical. Such plans are not only different for different people, but vary with different vineyards, wine types, and styles. For example, one would not expect the same list of Critical Control Points for a mid-level and premium wine, a Sauvignon Blanc or Chenin Blanc.

In developing a list of CCPs for SLO management, growers and winemakers become both empiricists and rationalists when using their knowledge from both experience and reason to create a HACCP outline (for a review of SLO issues, see Zoecklein, 2008). The following are a few CCP examples.

CCP: Vineyard management practices — Some vineyard spray materials, including elemental sulfur, can impact the formation of SLO. While a separate detailed viticultural HACCP plan should be developed, this discus-

Seven steps of an HACCP Plan

1. Create a flow diagram from vine to glass.
2. Identify the Critical Control Points at each step in the process.
3. Establish critical limits for each analysis to be conducted.
4. Develop a monitoring procedure for each Critical Control Point.
5. Establish a plan for corrective action whenever critical limits are exceeded.
6. Establish a record system to document action steps taken.
7. Develop a verification plan for all analyses utilized.

sion will highlight only a few vineyard concerns.

Nitrogen has received considerable attention because there is a positive correlation, although not always, with SLO production. Nitrogen, which is required by yeast to conduct a healthy fermentation, includes two forms — ammonia N, and a group of amino acids referred to as alpha-amino acids, or free amino nitrogen (FAN). Together, these two sources contribute the nitrogen utilized by yeast, referred to as yeast-assimilable nitrogen (YAN), or fermentable nitrogen. There is a correlation between low concentrations of YAN and SLO formation.

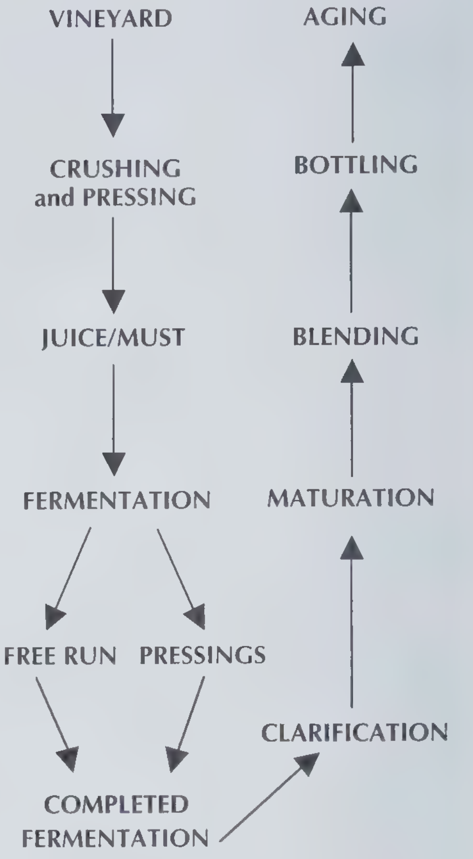
A number of viticultural and environmental factors can impact the nitrogen content of grapes and, therefore, could be important CCPs in an HACCP plan. These may include:

- Spray materials;
- Cultivar;
- Rot incidence;
- Block;
- Vineyard mulch;
- Crop load;
- Moisture stress; and
- Maturity.

From veraison onward, the following changes occur in the fruit:

- NH_4^+ increases, then declines;
- FAN amino acids increase, then decline, with the rate of decline different among FAN components; and
- With extended maturity, YAN declines.

Figure I: Create a flow diagram



HACCP allows the winemaker to understand the relationship between cause and effect. The first step in a HACCP program is to create a flow diagram from vine to glass.

In addition to the correlation between low concentrations of YAN and SLO formation, there may be some complex relationships among YAN components that impact SLO, including high threonine, relative to other amino acids, and the relative methionine-to-ammonia concentration. Some SLO formation, including diethyl sulfide, may suggest the importance of an understanding of the concentrations of specific YAN components (ammonia and amino acids).

Some generalizations regarding cultivars and YAN are listed below. It must be understood, however, that site, season, and vineyard management practices can have a very large influence.

- Merlot — usually low in YAN
- Syrah — usually somewhat low in YAN; this is coupled with high potential alcohol
- Pinot Noir — often sufficient in YAN

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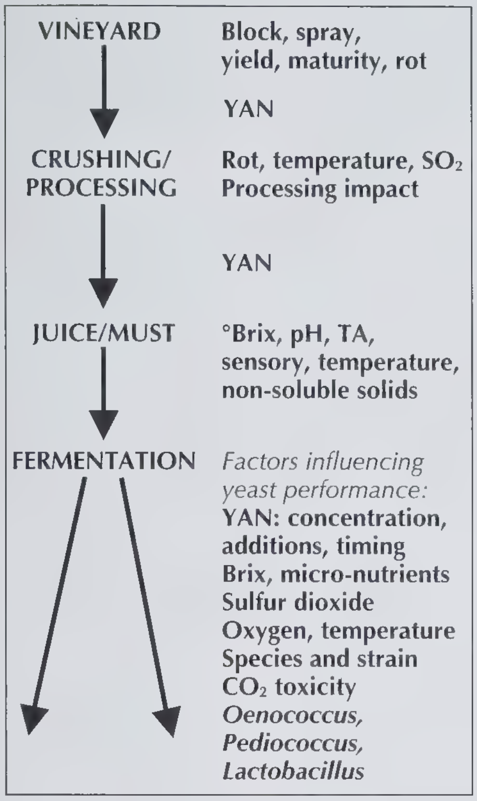
Figure II: Identifying the critical control points for SLO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With our understanding of the importance of YAN, and how grapegrowing and winemaking can impact YAN, we can create a specific HACCP plan for SLO management. For example, certain vineyard blocks consistently produce higher levels of SLO, possibly due to relative changes in the proportions of YAN components. Such blocks or sub-blocks should be segregated and treated differently. Vineyard factors such as yield, maturity, and incidence of fruit rot each impact YAN and, therefore, may be CCP in our HACCP plan. Rot can negatively impact YAN either directly and/or lower the concentration of micro-nutrients such as thiamine. It is reported that high levels of SO_2 (greater that 8 g/HL) can increase the production of SLO by allowing SO_2 to enter the yeast cell directly, bypassing the sulfate reduction system and possibly contributing to increased production of SLO.

- Sauvignon Blanc — often sufficient in YAN

Certain vineyard blocks will consistently produce higher levels of SLO. Therefore, a specific vineyard block may be a CCP. Block differences may be due, in part, to relative changes in concentration and/or relative proportions of YAN components (FAN vs. ammonia and specific FAN concentrations). Such blocks or sub-blocks should be segregated and treated differently.

Vineyard factors such as yield, maturity, and incidence of fruit-rot each can impact YAN, and, therefore, may be a CCP in an HACCP plan. For example, rot can negatively impact YAN directly and/or by lowering the concentration of micronutrients such as thiamine.

Impact of processing variations on SLO

Processing variations may be a CCP for the management of sulfur-like off odors. There is a relationship between juice extraction from the berry and YAN. Arginine (the FAN amino acid in

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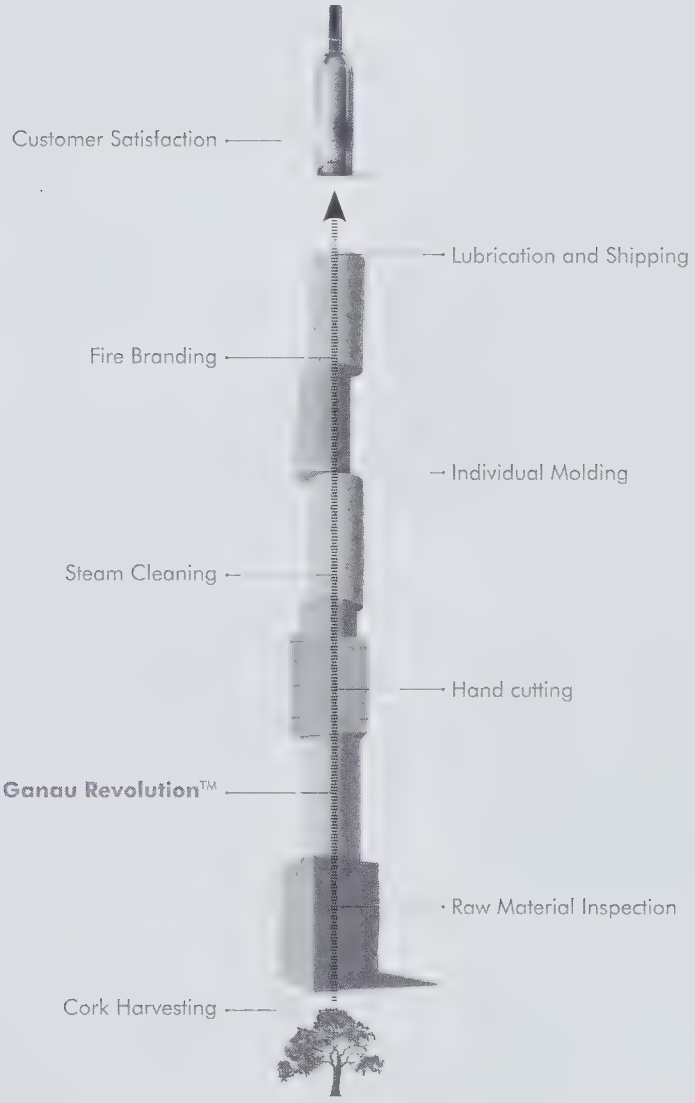

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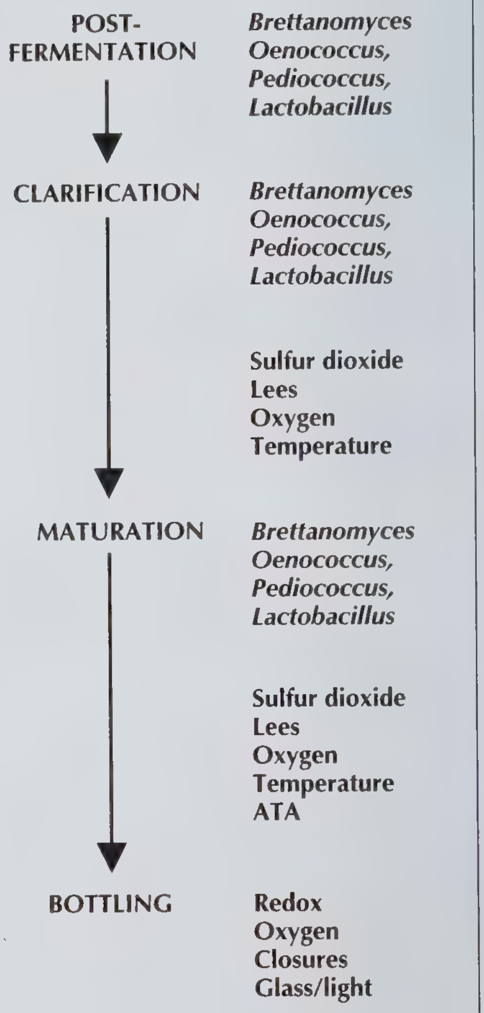
the greatest concentration) is located mainly in the skins.

Therefore, winemaking protocols, such as the following contrasts, may result in different arginine and, therefore, different YAN concentrations:

- Whole cluster pressing or crush and drain of whites;
- Bleeding-off or no juice removal from red grapes; and
- Short or long skin contact with red skins.

When evaluating the nitrogen status of grape samples prior to harvest, the relationship between sample-processing methodology and winemaking processing must be understood.

Figure III: Identify the CCP at each step in the process



High levels of sulfur dioxide (greater than 8 g/hL [80 mg/L]) may be a CCP (Figure II). Such levels may increase the production of SLO by allowing sulfur dioxide to enter the yeast cell directly, bypassing the sulfate reduction system.

CCP: Non-soluble solids level — Another possible CCP (see Figures II and III), is the non-soluble solids (NSS) level, both pre- and post-fermentation. Turbidity of white juice should be adjusted with some precision, to attain stylistic goals and the aromatic finesse of a wine.

Juice clarity can be measured in nephelometric turbidity units (NTUs). The desirable NTU range is considered to be between 100 and 250. Low non-soluble solids concentrations into the fermentor can result in a low concentration of YAN and other nutrients, and can increase the likelihood of SLO.

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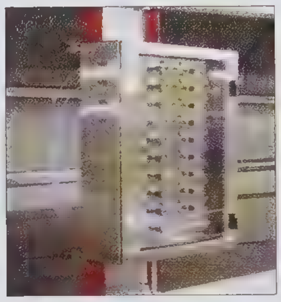

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High non-soluble solids increase the risk of SLO production, including higher molecular weight (high-boiler-type) sulfur compounds that are difficult to remove. High non-soluble solids in the form of post-fermentation primary lees can deplete oxygen content, lower the redox potential, and increase the potential of SLO.

CCP: Cold soak — Cold soaking is a common technique in the production of Pinot Noir and other red wine cultivars (see above section and Enology Notes and On-Line Publications at www.vtwines.info). Cold soaking can cause quantitative and qualitative changes in YAN, as a result of extraction, absorption, and possibly biotic factors.

For example, indigenous yeast such as *Kloeckera* spp. can grow, particularly if the cold-soak temperature is not below 10°C (50°F), depleting amino acids and micronutrients, including thiamine. It is possible that such depletions could result in conditions that promote SLO formation. Some winemakers have reported a decrease in the relative incidence of SLO with a prolonged, "clean" or biotic-free cold soak.

CCP: Oxygen management — Because of the impact of oxygen on fermentation performance, oxygen may be an important CCP. Yeast produce membrane lipids only when grown aerobically. In the initial growth phase, proper oxygen management leads to proper production and storage of sterols in the yeast cell, which can be shared with subsequent daughter cells.

It is possible to increase yeast ethanol tolerance by promoting the synthesis of sterols, by adding oxygen (air) in the starter and during fermentation. Yeast lees deplete the oxygen content and can impact the redox potential and formation of SLO. Some yeast-derived commercial products aid in sterol synthesis.

Oxygen management requires an understanding of the following:

- Optimum 8–10 mg/L oxygen during the initial growth phase;
- Oxidative stress may be a primary cause of early yeast mortality;
- Lees are potent oxygen consumers, even after yeast cell death;
- Lack of oxygen can contribute to SLO; and
- Initial oxygen additions may allow yeast to produce more glutathione, an important white wine antioxidant.

CCP: Yeast — Wine yeast play a central role in the production of volatile sulfur compounds, both the good and the bad.

Yeasts are responsible for the transformation of non-volatile grape-derived precursors to odor-active varietial aroma volatiles, which can positively contribute to the thiol-based varietal character of a number of cultivars including Sauvignon Blanc, Chenin Blanc, Riesling, Petite Manseng, etc. Wine yeasts vary tremendously with regard to this conversion.

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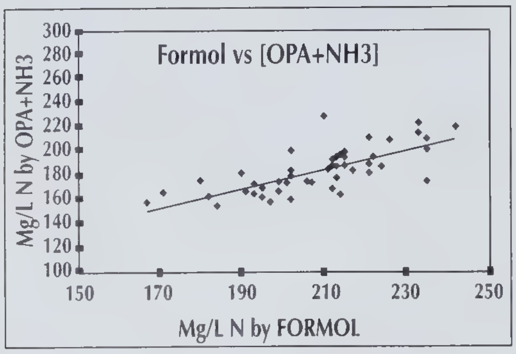

Figure IV: Correlation between the Formol titration and Nitrogen OPA plus NH_3.

Production of SLO is controlled more by yeast genetics than by winemaking; however, the fermentation environment does play a role. For example, the level of hydrogen sulfide (H_2S) can vary by as much as 2000-fold for a given strain, simply by changing the nutrient environment [Linderholm and Bisson 2005].

Some strains are less efficient users of nitrogen and have higher nitrogen requirements. Commercial strains can vary by more than 50% with regard to their nitrogen requirements. Uninoculated, native fermentation, with a large population of non-*Saccharomyces* cells (therefore not alcohol-tolerant) can cause problems by depleting nutrients, including oxygen. Non-*Saccharomyces* yeasts become inhibited by the increasing alcohol concentration, lose viability, and undergo autolysis during the early to mid-stages of the alcoholic fermentation.

CCP: Carbon dioxide — Carbon dioxide is toxic to yeast and can impact cell performance. The release of carbon dioxide from solution helps to minimize toxicity and decreases the lag phase of yeast growth.

Mixing during fermentation keeps the yeast in suspension, and helps to drive carbon dioxide out of solution, resulting in a lowering of carbon dioxide saturation. Mixing during fermentation may be important, regardless of the size and shape of the fermentor. Some addition products contain inert compounds like micro-crystalline cellulose, the purpose of which is to help release carbon dioxide, presumptively lowering the toxic impact.

Several other possible CCPs that may impact the production of sulfur-like off odors are outlined in Figures II and III. (For additional information see *On-Line Publications* at www.vtwines.info).

Step 3. Establish limits for each CCP that may impact SLO formation

A critical step in an HACCP plan is to establish acceptable ranges or limits for each CCP, when possible. This may involve chemical, physical, microbiological, and/or sensory analysis. YAN has received considerable attention because there is a positive correlation, although not always strong, between low YAN content and production of SLO.

As outlined above, the nitrogen required by yeasts to conduct a healthy fermentation includes two forms: ammo-

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nia N, and a group of amino acids referred to as alpha-amino acids, or free amino nitrogen (FAN). Together, both sources contribute the nitrogen utilized by yeast, referred to as yeast-assimilable nitrogen (YAN), or fermentable nitrogen.

The *minimum* YAN required is approximately 140 mg/L for a 21° Brix juice, and perhaps 250 mg/L for a 23° Brix juice. However, these concentrations are broad-based generalizations for several reasons:

- The nitrogen level requirement to optimize fermentation is highly yeast-strain specific, governed largely by the genetics of the yeast and the environment.
- The relative proportion of the YAN components (including the makeup of FAN amino acids), not simply the total YAN, is the most important factor. This may help to explain so-called "reductive" grapes — varieties that have a greater tendency to produce SLO. It also may help explain seasonal and block differences in SLO production.
- A low concentration of YAN is often coupled with deficiencies in important micronutrients required for optimum yeast performance.

STEP 4. MONITORING CCPS AND SLO

CCP monitoring involves chemical, physical, microbiological, and/or sensory analyses. With regard to YAN, two common procedures for measurement of fermentable nitrogen are the Formol titration and the NOPA test. We modified the Formol titration procedure to include a low-volume procedure and compared the results with the NOPA method [*Am. J. Enol. & Vitic.* 53:325–329]. Some features of these two procedures are summarized below:

Formol Titration

- Simple titration procedure;
- No instrumentation required;
- Precise, but not extremely accurate; and
- Measures both FAN and ammonia nitrogen.

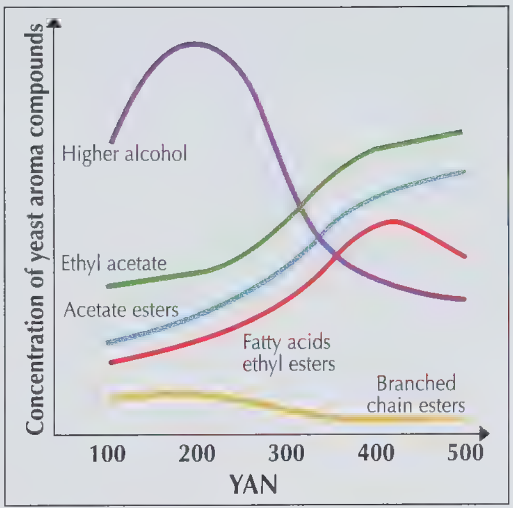

Figure V: Relationship between initial YAN concentration, and final concentration of volatile compounds after fermentation. Source: Ugliano *et al*, 2007.

NOPA Procedure

- Measures FAN, but not ammonia nitrogen;
- Must measure ammonia nitrogen separately;
- Requires spectrophotometer;

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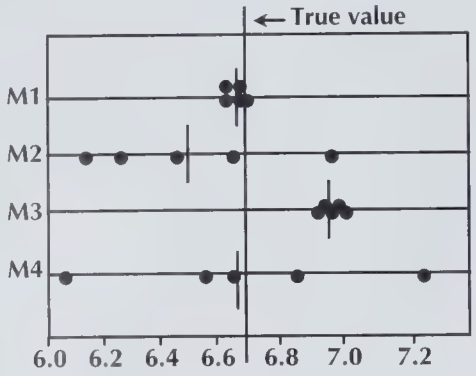
Figure VI: Precision and accuracy — comparison of analytical methods



Mean value for each method indicated by vertical line.
M1 = Precise and accurate
M2 = Not precise or accurate
M3 = Precise, not accurate
M4 = Accurate, not precise

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Formol titration has the advantage of measuring both ammonia and FAN amino acids. However, the method titrates proline (which yeast cannot use) and does not react with all the nitrogen in arginine that the yeast may be able to use. Our research suggested that this generally balances out, although the proline/arginine ratio can vary significantly.

Arginine accumulation begins well before veraison and continues to maturity, then reaches a plateau. Proline, on the other hand, increases late in the season (four weeks post-veraison). High proline is associated with increased maturity and vine stress.

Figure IV shows the relationship between the two tests. The methods are comparable, demonstrating reasonable linearity. Formaldehyde is a carcinogen and must be used with caution. A low-volume (2.5 mL) Formol procedure has been developed (available at www.vtwines.info; click On-line Publications, then Fermentable Nitrogen: Formol Titration/Reduced Volume Formol Titration).

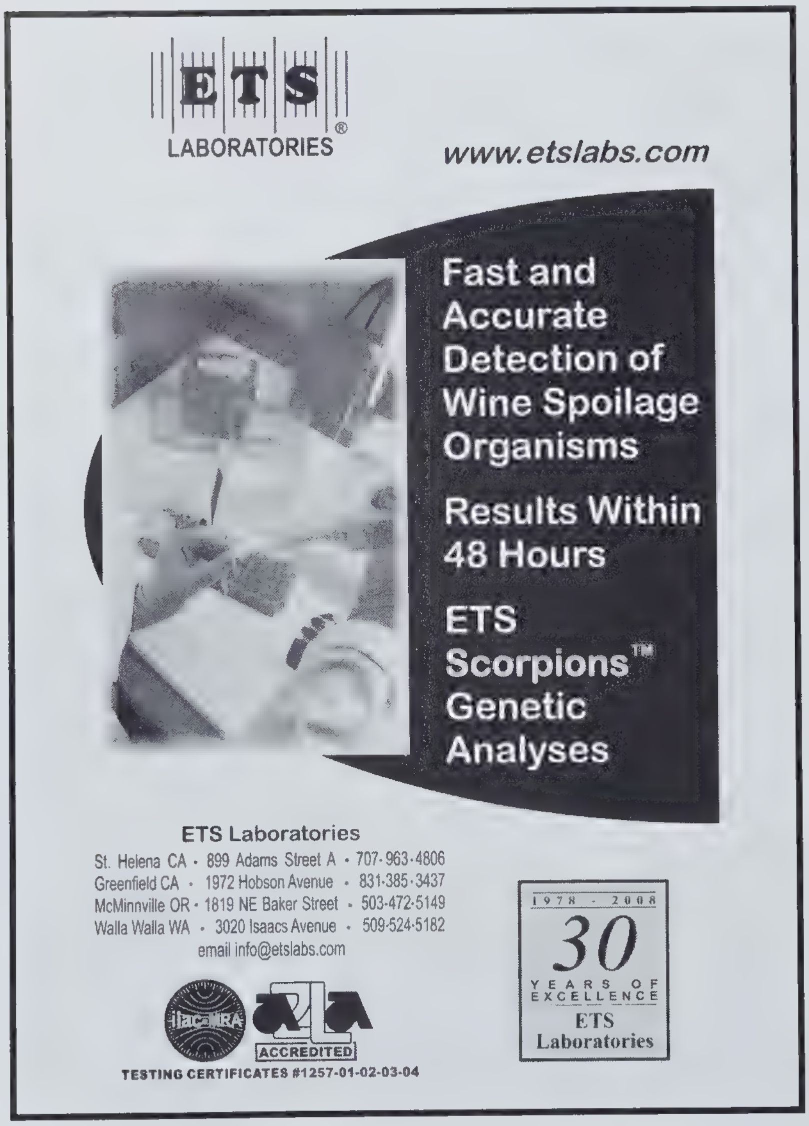
Sensory as Critical Control Point

In winemaking, monitoring frequently involves sensory evaluation. One common difficulty is that such evaluations are frequently performed under less-than-optimum conditions, which can impact the sensory response.

Sensory analysis must involve an understanding of the following:

- Standardized and controlled environment;
- Representative sample;
- Sample temperature;
- Glass type, volume;
- Elimination of bias;
- Importance of sample contrasts;
- Evaluators — who they are and their skills; and
- Number of evaluators required to gain a true picture.

George Berkeley (the 18th century empiricist), suggested that our only knowledge of the world comes through our senses: *"Esse est percipti,"* to be is to be perceived. Perhaps the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negative corollary is that if we do not perceive something in the glass, it is not there. Unfortunately, many winemakers sensorially evaluate under less-than-ideal conditions that may impact perceptions.

SLO sensory evaluations can be enhanced using the aroma screen method listed at www.vtwines.info. Click On-Line Publications, then Hydrogen Sulfide/Mercaptan Aroma Screen.

STEP 5. ESTABLISH A PLAN FOR CORRECTIVE ACTION FOR SLO MANAGEMENT

If the YAN content is low, the concentration and timing of supplement additions must be done properly.

Improper concentration and timing of N supplements can result in the following:

- Increased production of SLO;
- Increased unwanted flora (if added too early or too late);
- Rapid fermentation;
- Loss of volatiles, particularly if the source is diammonium phosphate (DAP); and
- Decreased complexity.

Too much nitrogen can stimulate the growth of unwanted organisms, increase the biomass, and cause too rapid a fermentation. Rapid fermentation can increase aroma compound loss due to increased volatility, resulting in the loss of complexity. Additionally, ammonia (in the form of DAP) can limit the appearance of aromatic degradation products from amino acids.

Amino acids are an important source of yeast-derived esters, which can add to complexity and wine quality. Thus, a supply of nitrogen must be available at the early stage of fermentation to allow a continuous resynthesis of proteins. If that does not occur, the yeasts lose the ability to conduct the fermentation.

The various volatile groups found in wine and impacted by YAN are listed below. While this shows the trends observed, it should be noted that Figure V does not represent quantitative relationships among different chemical classes.

Nitrogen addition may be effective in avoiding problem fermentations until about two-thirds of the sugar is utilized. After that, yeast will not respond to added nutrients. Therefore, at this stage, addition of N-containing nutrients has no positive impact.

At the end of fermentation, most of the H_2S formed during the initial phase is removed by the production of carbon dioxide. Far less CO_2 is produced late in fermentation, which means less of the H_2S produced will be lost due to entrainment with carbon dioxide.

There are significant differences between native (fruit-derived YAN) and addition products. Addition of nutrient products may not provide the same results as having an adequate native N concentration. Vineyard management that produces adequate fruit YAN may be very important.

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Fermentation complements/addition products often contain some of the following:

- Inorganic nitrogen (DAP);
- Organic nitrogen (alpha-amino acids):
- Unsaturated fatty acids;
- Sterols, thiamine, folic acid, niacin, biotin, and calcium pantothenate;
- Magnesium sulfate;
- Inactive yeast cell walls;
- Peptides;
- Micro-crystalline cellulose; and
- Other yeast autolysis products, glutathione.

The possible benefits of complex yeast nutrient addition products include better resistance to oxidation as a result of increases in glutathione, higher levels of free sulfur dioxide, better color, and increased protection of aromatic quality. Winemakers should consult manufacturers' product literature for information regarding nutrient additions and timing. There are time-release nutrient products currently available.

Winemakers must understand post-fermentation SLO management options, which include the following:

- The role of oxidation-reduction potential on the sensory characteristics of SLO;
- Monitoring methods for SLO;
- Oxygen management, aeration, microoxygenation;
- Copper additions;
- Antioxidants (ascorbic acid, sulfur dioxide, glutathione);
- Carbons;
- Lees management/yeast fining;
- Tannins; and
- Wine closures.

Post-fermentation, it is important to conduct a careful sensory monitoring for the presence of SLO. If sulfur-like odors are present, the nature of the compound(s) present should be determined. This can be as elaborate as a gas chromatographic assay or as simple as a sulfite aroma screen.

Copper sulfate and cadmium sulfate aroma screens can be used to easily determine the presence or absence of hydrogen sulfide, mercaptans, and some disulfides [see Zoecklein *et al.*, 1999]. Determining, at least, the general nature of the SLO is important. Such information allows for an understanding of the optimum cellar treatment(s) that may correct the problem while optimizing wine quality.

Sensory thresholds can vary depending on the matrix (the type of wine, most notably the nature of phenols). SLO can be divided or separated a number of ways including by their volatility. Lighter compounds such as hydrogen sulfide, methyl mercaptan, and dimethyl sulfide are produced both during and post-fermentation. Because of their volatility, some attempt to lower the concentration of members of this group by aeration, sparging, or both. Members of this group generally react with copper.

Higher molecular weight, less volatile (high-boiler-type) SLO such as methionol, dimethyl disulfide, and diethyl disulfide are produced by yeast metabolism during fermentation, not post-fermentation. These remain stable in wine (post-fermentation), cannot be removed by aeration due to their limited volatility, and do not react with copper.

Other sulfur-containing SLO such as thioesters are odorless, but can undergo hydrolysis, or breakdown, to release thiols, thus contributing to disagreeable odors. Thus, understanding the nature of the compound(s) present is key to understanding desirable remedial cellar practices.

One possible post-fermentation corrective method involves adding inactivated yeast (30 g/hL). Yeast and materials in some proprietary products can bind with some SLO. Inactive yeast is thoroughly mixed in a laboratory trial and evaluated after one week against an untreated control wine. If this treatment is not effective, a sensory evaluation with copper sulfate, followed by yeast fining or the addition of an inactivated yeast product, is conducted.

Copper is viewed by some as the resolution for SLO problems. It reacts only with certain SLO compounds, and therefore may not correct the problem. Copper reacts with thiols, some of which contribute to the vari-

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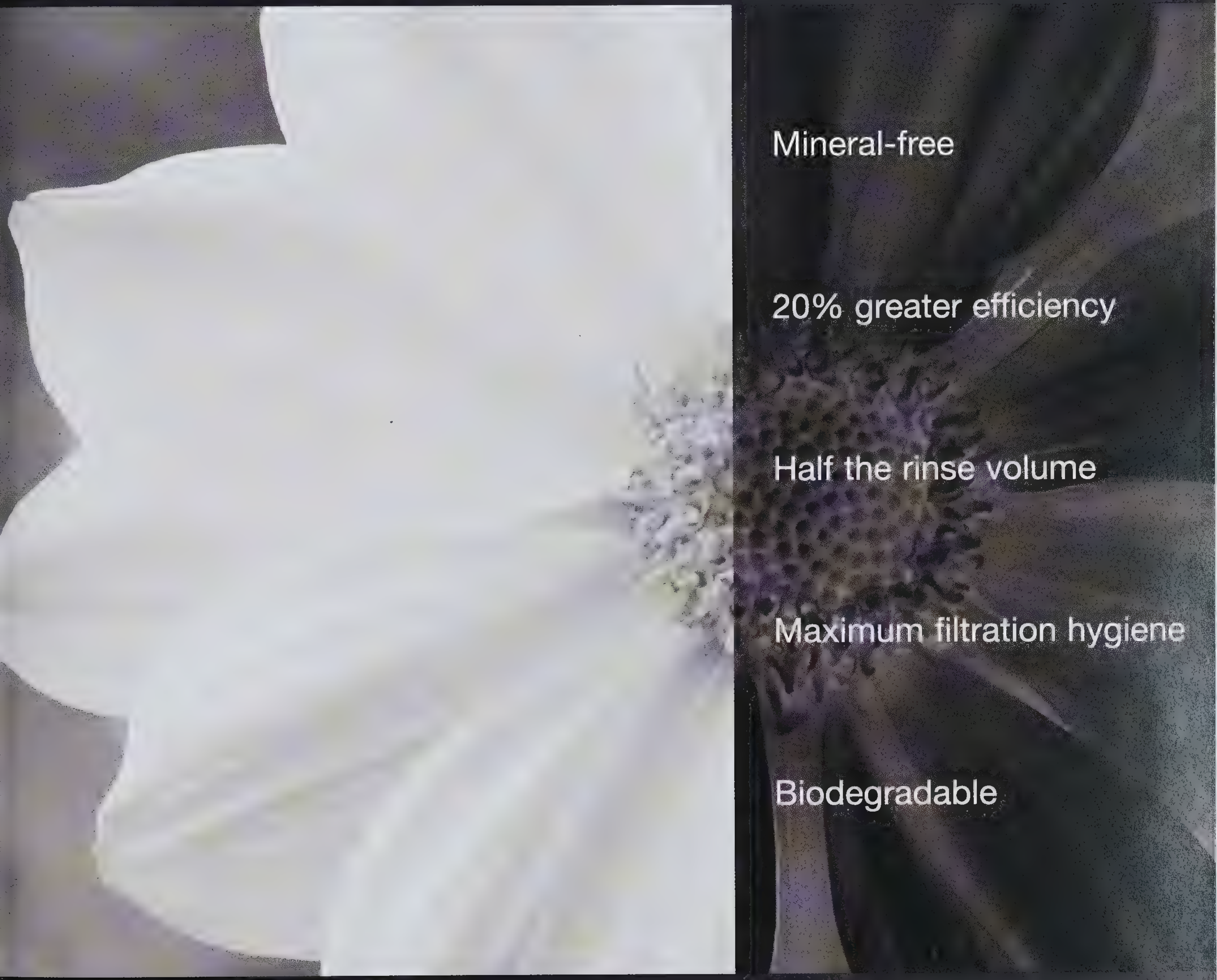

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etal character of Sauvignon Blanc, Chenin Blanc, Petit Manseng, etc.

Copper completely removes 3MHA (3-mercaptohexyl acetate), an important component of Sauvignon Blanc. Copper is a strong oxidizing agent that can deplete glutathione concentration, and may negatively impact wine longevity (see Zoecklein, 2008). An understanding of the impact of residual copper content, the impact on varietal character, and wine longevity is important.

Another practice used by some winemakers involves the addition of deodorizing carbon. While possibly effective in binding some SLO, the addition of carbon may cause carbon-catalyzed oxidation. Because the carbon molecule contains a great deal of air, additions may increase wine oxidation.

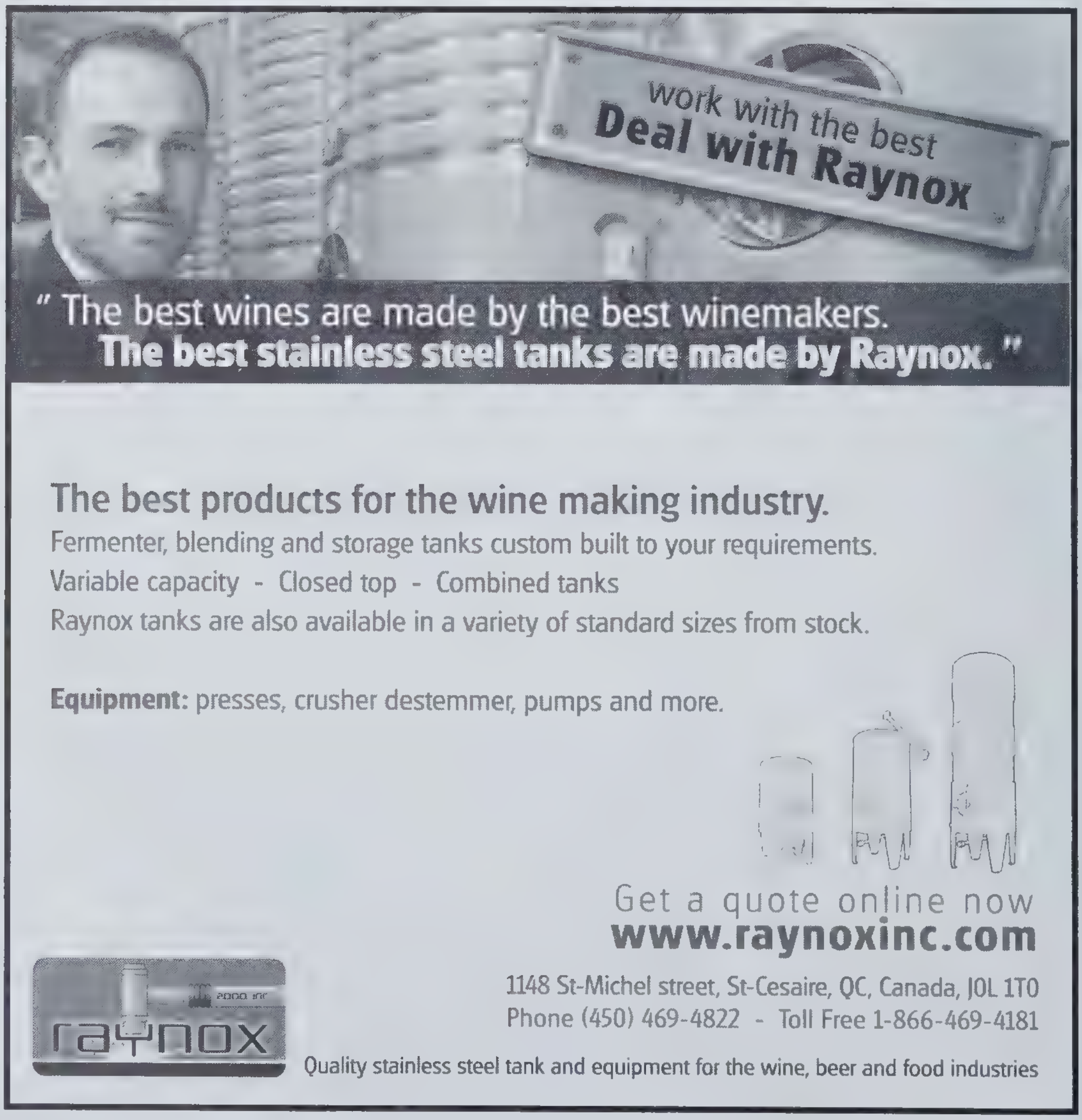
For example, the diethyl sulfide adsorption onto a carbon particle likely also results in its oxidation to diethyl sulfone, resulting in a change in sensory perception. The problems associated with carbon-catalyzed oxidation and the non-specific nature of its binding limit the effectiveness as a remedial tool. If this is incorporated, careful monitoring plans should be written into an HACCP program.

STEP 6. ESTABLISH AN ADEQUATE RECORD SYSTEM

An HACCP plan can aid in understanding the cause and effect relationships involved in SLO production. Because the development of CCPs comes from empirical knowledge tailored to specific circumstances, adequate record keeping is vital. HACCP plans must be supported with adequate recordkeeping. Choosing the optimum software for your vineyard and winery operations requires an understanding of your needs, cost of software, training required, update availability, etc.

STEP 7. DEVELOP A VERIFICATION PLAN

As you create your HACCP plan, incorporate precision and accuracy of



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your test methods into the flow. Are your analytical methods sound, precise, accurate? Are you performing sensory with the proper level of control? An example of the differences between precision and accuracy is illustrated in Figure VI. Four methods are shown. The means of the five data points are indicated by a vertical line and can be compared to the true value.

Conclusion

HACCP represents a systemic approach to grape and wine quality control that can be tailored to specific production issues and considerations. It can assist in understanding the impact of the variety of individual processing decisions that individually may seem insignificant, but collectively impact wine palatability and style.

One problem with simple observation is that if two outcomes are similar, we tend to believe they have similar causes, which is not always the case. HACCP can help to answer several universal, philosophical, yet practical questions. What data is certain and why? Is one way of gathering facts about your vineyard and/or wine more dependable than others?

HACCP is a method for enhancing the understanding of some of the relationships between cause and effect in the complex world of sulfur-like off odor management. Unfortunately, much remains unknown about SLO production.

Research needed in understanding sulfur-like off odors includes:

- Qualitative and quantitative effects of vineyard management on nitrogen and sulfur;
- Sulfate uptake by vines;
- Sulfur-demand of vines;
- Sulfur transport and source-sink relationships;
- Influence of S fertilization on grape and wine quality; and
- Role of glutathione in the vines, grapes, and must and wine. ■

"It is what you learn after you think you know it all that really counts."

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THROUGH TRIAL AND ERROR

A virtual winery in the making

BY Deborah Steinthal

With the maturing of the wine industry, the dynamics of consolidation and competition are posing new challenges for wine brands. Consequently, a number of winemakers are acting as change-makers — seeking new ways to build a profitable business through a virtual winery model, as builders of negociant brands.

Five change-makers listed in the sidebar (Five Virtual Winery Models) all have been "around the block" in the wine world, and would agree that they have learned as much from their mistakes as from their successes.

As many an entrepreneur in wine, Scott Harvey too has been "around the block" (see sidebar — Scott Harvey's History at a Glance). He has built a solid reputation as a winemaker more than once: first in the Sierra Foothills; second in Napa Valley; and third as a producer of Germanic-style wines. He has built brands more than once: first, Santino; second, Renwood Estates; and third, Folie à Deux. And he has lost everything with the ability to rebuild more than once.

Harvey has learned some significant lessons from his many lives and is now incorporating these hard-earned philosophies into running his own business, Scott Harvey Wines. Harvey is fond of saying, "When a vision is bigger than you are, you get pushed into a leadership position." Harvey's virtual business model is still young and has yet to be proven, but he is delighted to share his view of the world (see Nine Life Lessons sidebar).

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Benefits and challenges of a virtual winery or negociant brand

A virtual winery is, essentially, a wine merchant whose competitive advantage is building national brands and distribution and who outsources production. Well-managed virtual models have faster and stronger financial returns since they are not incurring the huge cost of financing large vineyard and winery assets and operations.

"The huge challenge of this model is managing production logistics among our various out-source partners and facilities, particularly during harvest," says Dan Leese, co-founder of 585 Wine Partners (Sonoma, CA).

James Hall (production manager for Patz & Hall, Napa, CA), explains: "Core to the Patz & Hall wine model has been the very deep relationships formed with our vineyard sources, working as partners in driving viticultural decisions and farming practices, ensuring that we have an approach to winegrowing where both the farmer and the winemaker win."

This approach has enabled Patz & Hall and their vineyard partners to establish strong awareness with consumers, branding nationally renowned vineyard designates from Hyde, Zio Tony, and others.

"Having access to the highest quality vineyards is everything," says David Green, general manager for Joel Gott Wines (St. Helena, CA). These vineyards want to be associated with a winemaking icon such as Joel Gott.

The negociant model developed by Don Sebastiani (Sonoma, CA) and his family leverages grape sources and provides the family tremendous flexibility and cost advantages as they launch new brands and build volume in a competitive marketplace.

The notion of strong returns and flexibility is what attracted Scott Harvey to the virtual winery/negociant brands concept.

New Scott Harvey model — How it works

In June 2004, armed with his life lessons and a big vision, Scott, with wife Jana (who has 20 years experience in sales and marketing with leading Napa Valley wineries), launched Scott Harvey Wines.

"It is amazing," says Harvey, "95% of the people I have helped in the past became investors later." First, the new owners leveraged their strong relationships with 25 friends and colleagues at

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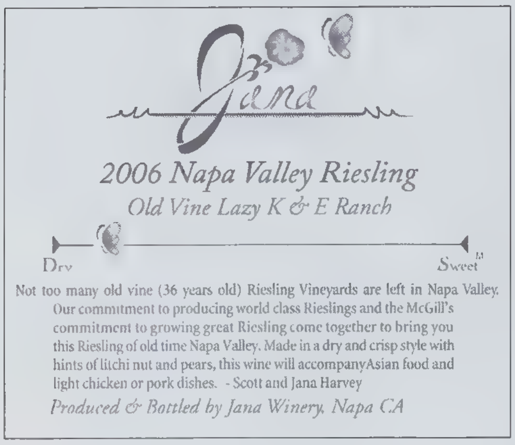


Jana

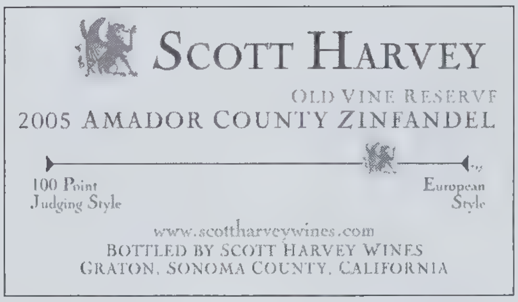
2006 Napa Valley Riesling
Old Vine Lazy K & E Ranch

Dry Sweet

Not too many old vine (36 years old) Riesling Vineyards are left in Napa Valley. Our commitment to producing world class Rieslings and the McGill's commitment to growing great Riesling come together to bring you this Riesling of old time Napa Valley. Made in a dry and crisp style with hints of litchi nut and pears, this wine will accompanyAsian food and light chicken or pork dishes. - Scott and Jana Harvey

Produced & Bottled by Jana Winery, Napa CA

Jana Riesling label has a "sweetness" scale that Harvey hopes more wineries will use on their labels.



SCOTT HARVEY

OLD VINE RESERVE
2005 AMADOR COUNTY ZINFANDEL

100 Point Judging Style
European Style

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GRATON, SONOMA COUNTY, CALIFORNIA

Zinfandel label has a "wine style"scale that Harvey hopes other wineries might adopt.

$25,000 each to fund the business launch. Harvey explains, "We maintain control through our owning interest in 50% of the founder shares."

Next, since Harvey had trademarked his name while at Folie à Deux, he entered into a lease agreement with Winery Asset Management doing business as Folie à Deux for the remaining inventory, which gave him immediate cash flow. Scott and Jana released 6,000 cases of their 2004 vintage to the market. The Scott Harvey portfolio and brand platform is comprised of wines from two regions: Amador County and Napa Valley (Cathedral — a Cabernet blend — and Riesling).

Jana and Scott's main goal is to sell through several sales channels and establish a clear identity in each. In wholesale distribution, their focus is on secondary markets. They have launched their Amador County tasting room and there is a website to support this tasting room. Their strategy is to up-sell the competition to get control in all channels and leverage their boutique advantage, since customers relate to perceived small brands.

Five Virtual Wine Models

JOEL GOTT WINES (Cabernet Sauvignon, Zinfandel, and Syrah)

585 WINE PARTNERS (Red Truck, White Truck, and Pink Truck; Picket Fence)

DON SEBASTIANI & SONS (Multiple brands: Smoking Loon, Pepperwood Grove, Aquinas, Quatro, Fusee, Apoyo, Plungerhead, Hey Mambo, The White Knight, and Gino da Pinot)

PATZ & HALL WINE CO. (Pinot Noir and Chardonnay vineyard designates)

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Scott Harvey's History at a Glance

1975	1974–1992 (except 1975)	1992–1995	1996–2004	2004–present
Oenology school — Weinbau Schule, Neustadt, Germany	Winemaker/GM — Santino Vineyards, Amador County (Joseph Schweizer, owner).	Winemaker — Renwood Estates — A partner and Scott Harvey started Renwood and purchased Santino.	Winemaker and President — Folie á Deux purchased by Dick Petersen & George Schofield.	Together with wife, Jana Harvey (National Sales) Winemaker/owner — Scott Harvey Wines / Jana Winery.
	Established reputation as Zinfandel producer.	Established reputation as 40,000 case Zinfandel producer.	Built Menage á Trois brand to 50,000 cases.	Launched 6,000-case brand.
	Challenge: Built brand until Joseph Schweitzer sold it.	**Challenge**: Worked hard to build brand and lost equity position.	**Challenge**: Too many wines under the brand.	**Opportunity**: Virtual winery model for profitability and flexibility.
			Launched Scott Harvey brand.	

Marketing to consumers is a huge challenge in today's consolidated wine market. Harvey claims that, "When you are building a brand, people do not consider it viable until they have seen it seven times." Examples of brand-building visibility include:

1. Recommendation by a friend
2. Robert Parker, *Wine Spectator* ratings
3. Restaurant wine list placement
4. Awards
5. Mentions by wine writers such as Jancis Robinson
6. Winemaker dinners
7. Retail store placement

"Wine is sold by word of mouth," says Harvey. "The more people that have a good experience with your wine and the more mouths you get the wine into, the more the word of mouth develops sales for you. People drink and buy an experience."

Production costs and logistics are Harvey's biggest headache for the

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moment, since he is custom-crushing grapes at several locations. He is evaluating options for consolidating and better managing his cost of goods without losing wine quality and style.

Finally, this young company has learned from the founder's past and built a board of directors of seven people who are all about governance. "I learned from my previous lives in this industry that a large group of investors who are all about lifestyle does not help an owner govern or drive accountability for performance against a plan," says Harvey.

While serious conversations happen in the board room, Scott and Jana also know how to leverage the investors as brand ambassadors in the marketplace. Every investor receives a medallion when a wine receives an award; they have business cards that say "owner;" and they love working the market wherever they live and travel.

Looking to the future

Scott Harvey's history is still in the making and he has a long way to go before he achieves his personal vision. How he will overcome some significant challenges and meet his top goals over the next 12 months is still unknown. These goals include cutting the cost of goods by 30% by moving to one facility; increasing distribution through all channels; paying attention to business performance, and driving gross margins.

What is known about this winery leader is that he is living every day with the passion and conviction that he will succeed, through trial and error, to build and then sell his brand and make his shareholders rich. ■

Deborah Steinthal is Founding Partner of Scion Advisors, a family wine business advisory group. Scion Advisors works along side winery owners who are navigating challenging transitions; to drive better decisions that solve tough problems, build higher levels of performance and achieve long-lasting results. For more information, visit www.ScionAdvisors.com, or contact Deborah at 707/258-9130 or deborah@ScionAdvisors.com.

Nine Life Lessons learned from brands Scott Harvey launched and lost

1. Live with passion and conviction.
2. Structure a healthy business where you have control.
3. Protect ownership rights through trademark-protecting every label.
4. Stand for something meaningful to your consumer — both your style and identity.
5. Put your trust in people and develop goodwill and friends at every opportunity.
6. Learn how **not** to run a board of directors.
7. Build a brand through focus and channel control.
8. Invest in your business and play to your competitive advantage.
9. Pay relentless attention to business performance.

Trialing new package for Scott Harvey wines

BY Tina Vierra

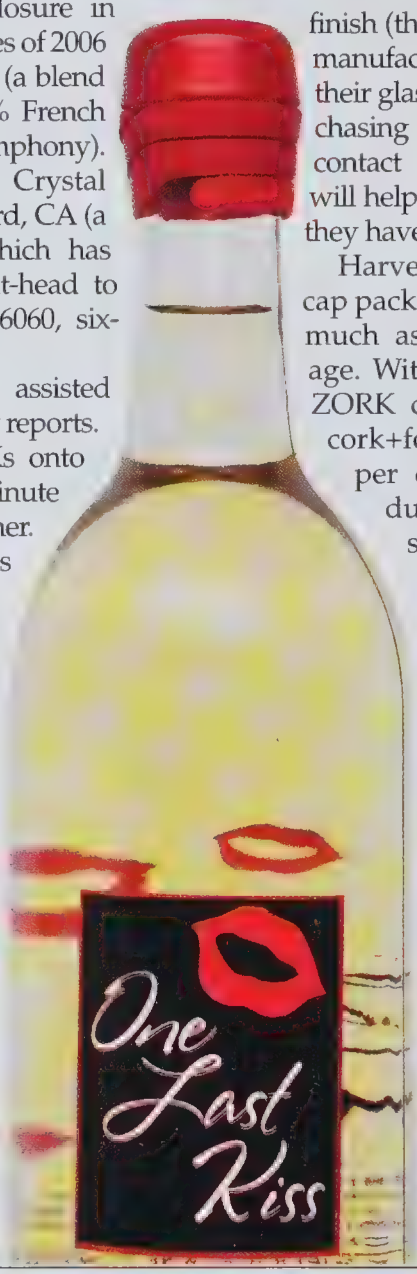
Scott Harvey did a trial bottling with the ZORK closure in early 2008; 1,600 cases of 2006 *One Last Kiss* white wine (a blend of 51% Chardonnay, 35% French Colombard, and 14% Symphony). Bottling was done at Crystal Valley Cellars in Lockeford, CA (a Cosentino property), which has installed a machined flat-head to seal ZORKs on a GAI 6060, six-head foil spinner.

"A ZORK technician assisted the first bottling," Harvey reports. "We hand-placed ZORKs onto about 38 bottles per minute just ahead of the spinner. The new, flat head pushes the ZORK straight down to seal."

The free SO_2 level was the same as when Harvey bottles other wines under cork.

The bottle originally chosen by Harvey for *One Last Kiss* did not have the correct interior diameter (ID) of the bottle neck to accept the ZORK. The glass was returned, and Harvey ordered bottles from a supplier list provided by ZORK.

"The problem with replacing the glass," Harvey says. "Is that the bottles with the proper ID cost $1 more per case. When I'm working with a low-margin wine like *One Last Kiss* ($15 retail per bottle), I have to hold costs down."



Beth Cozza (ZORK) advises, "ZORK will fit on bottles with the standard Glass Packaging Institute (GPI) cork finish (the finish number varies by manufacturer). Wineries can ask their glass supplier if they are purchasing the GPI cork finish, or contact ZORK directly, and we will help them with any questions they have about the glass."

Harvey calculates that screw-cap packaging costs about half as much as a cork-plus-foil package. With this first bottling, the ZORK cost about the same as cork+foil, plus the glass cost $1 per case more. ZORK producers say that most GPI-standard glass is priced at competitive rates, and that, as with most products, the per-item ZORK cost is lower on large-quantity orders.

Harvey hopes for two developments to improve costs: that retailers and consumers of his wines like the ZORK package, and that ZORKs will come down in price if they're more widely-adopted in the wine industry. ■

Sustainable approaches to viticulture and winemaking

BY Bibiana Guerra,
Senior Technical Writer,
Viticulture & Enology, UC Davis

New, more sustainable approaches to viticulture and winemaking are rapidly gaining momentum, as growers and winemakers are becoming more environmentally aware.

Some approaches from a sample of research articles are summarized below. Topics include how to control disease with organisms naturally living in vineyards, how to control disease using environmentally-friendly products, the benefits of compost, a comparison between biodynamic and organic farming, and the use of native yeasts for low-input winemaking.

Grapes and vineyard soils as sources of microorganisms for biological control of *Botrytis cinerea*[1]

F. Carrau and his team (in Uruguay), searched for a cure to bunch rot. They thought that organisms antagonistic to *Botrytis cinerea* might well be already living in the complex environment of the vineyard floor; they just needed to be found.

They isolated and cultured 200 yeast and bacteria, using a plating technique already available in the times of Louis Pasteur. After plating these isolates in the presence of the pathogen, they observed which organism inhibited which. A reduction in the number or size of the colonies formed by *Botrytis* meant that the tested organism was a potential candidate for natural bunch rot control.

In this way, Carrau and his team found that one isolate of the bacteria *Bacillus* sp., and one isolate of the yeast *Hanseniaspora,* were very effective in reducing bunch rot in Tannat (88% reduction). Next, they inoculated a fermentation with each of these "winning candidates" to test how well they "got along" with the wine yeast *Saccharomyces cerevisiae.* They could find no problems at this level. The researchers are currently testing the effectiveness of these two organisms when sprayed in the vineyard.

Evaluation of biological and abiotic controls for grapevine powdery mildew

I. Greenhouse studies[2]

II. Vineyard trials[3]

P. Crisp and colleagues in Australia realized that, despite increasing concerns about the use of pesticides and sulfur for control of powdery mildew, a thorough program that would test the effectiveness of natural products for South Australia conditions was lacking. They started one in 2000.

First, they tested a wide range of products in a controlled greenhouse environment. These included dairy products (milk, whey, lactose), other inorganic agents (vegetable oils, sodium carbonate, potassium bicarbonate, yeast extract), and microorganisms (*Bacillus subtilis, Trichoderma harzianum, Pseudomonas syringae*).

After the greenhouse studies showed that whey, vegetable oil, and *Bacillus subtilis* were effective in reducing the percentage of leaves affected by powdery mildew, they tested the products under field conditions. They found that all products tested were quite effective in situations where the canopies were thin and open (less than 30 cm), allowing for good spray coverage.

Unfortunately, in more vigorous situations (canopies greater than 1 meter), plenty of mildew developed with even the most promising materials. In three consecutive years, the trials had to be abandoned, and the owner had to resort to a wettable sulfur spray (3 g/hectare) to save the commercial crop.

The authors found that whey, milk, and certain combinations of these compounds with sulfur, were very useful in controlling powdery mildew in non-vigorous situations.

Yields were higher for every material tested when compared to the untreated control. The vines treated with sulfur had the highest yield.

Why, whenever sulfur is involved, yields are always increased? To my knowledge, no mechanism has been put forward.

Compost benefits and quality for viticultural soils[4]

A. Cass and M. McGrath explain that soils deteriorate because normal farming practices gradually cause coalescence, slaking, dispersion, compaction, and aggregate pulverization. They then explain how compost has the ability to alleviate these unavoidable processes through its effect on raising all of the following: soil size distribution, water-holding capacity, infiltration, hydraulic conductivity, aggregate stability, and biological activity.

The authors discuss the factors to pay attention to when selecting a good quality compost. A compost should be: 1) mature (C:N<20); 2) low in salts (particularly boron and sodium, which are toxic to the vines); 3) low in heavy metals (no sewer sludge); 4) low in pathogens (no herbicide and pesticide residues, weed seeds, or coliforms); and 5) should have adequate nitrogen levels for a particular vigor situation (<300 mg/kg ammonium, and <40 mg/l nitrate is normally desirable), unless the vines are so weak that excess vigor is not an issue.

Soil and winegrape quality in biodynamically and organically managed vineyards[5]

In a Mendocino County study, J. Reeve and colleagues approached the controversial field of biodynamics. They farmed adjacent blocks either organically or biodynamically for six years. Their study is rigorous, and they also seem to start at the right place: find out whether the soil was affected first, rather than look for vine/wine differences.

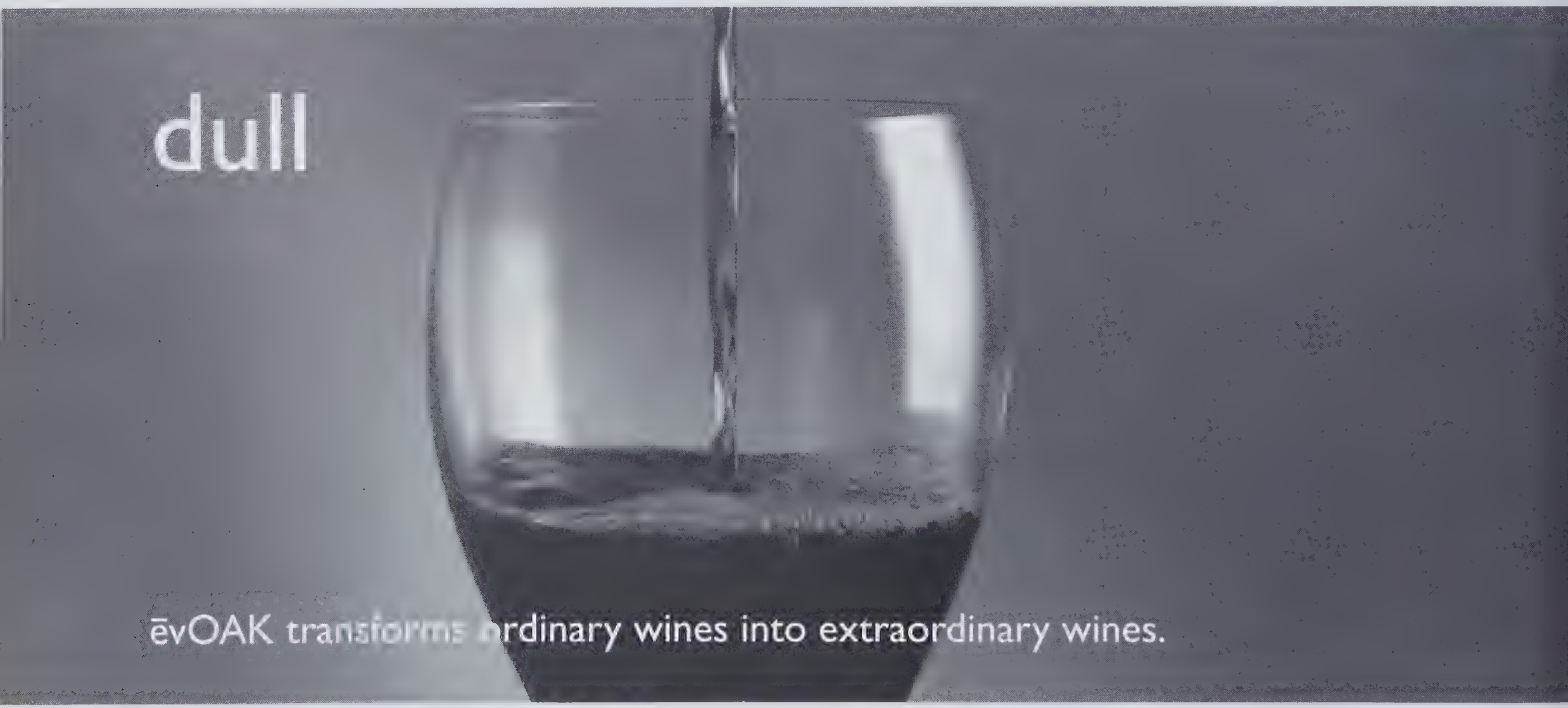
After six years, biodynamic practices did not offer an advantage over organic farming in regard to soil composition, vine nutrition, or juice composition levels. Biodynamics did seem to help some to achieve vine balance.

When the authors looked at the viticulture parameters (yield, cluster number, pruning weights, fruit to pruning ratio), they found one difference in their well-replicated, well-randomized trial: biodynamic vines had fruit-pruning ratios that indicated better vine balance than those of organic vines, which were slightly overcropped (4.5 to 5.3 ratios for biodynamic vines compared to 6.3 to 6.5 for organic vines).

The authors define what their "biodynamic farming" consisted of, and how it differed from organic methods. The main differences were the addition in the biodynamic block of the following: 1) two cow manure sprays, 2) a finely-ground quartz silica spray, 3) a barrel-compost spray, and 4) addition of "preparations" to the compost used in the biodynamic block — but not to the compost used for the organic block. The authors also explain (with a data table), the nature of their biodynamic "preparations."

Native yeasts for low-input winemaking: Searching for wine diversity and increased complexity[6]

F. Carrau studied the yeasts available to achieve a winemaking style with a



minimum amount of additives, or what he calls "low-input winemaking." How do we achieve that and still ensure high-quality wines?

Instead of using high nitrogen (N) demand yeasts that either require supplements or else produce sulfide problems, the author reasoned, why not use a naturally low-N demand yeast that would actually feel "at home" in the harsh environment of a juice fermentation (low N, low pH, high alcohol, SO_2)?

Using an artificial must (low in nitrogen content), Carrau and his colleagues isolated what he calls the "new generation" of yeast strains. These isolates are currently undergoing fermentation and sensory evaluation tests.

Additionally, and without letting the current thought that apiculate yeasts are inadequate for winemaking stop him, Carrau screened these wild yeasts in search of those rare individuals that might carry a sensory advantage.

Carrau found that 10% of the wild strains isolated from Tannat skins had good and interesting sensory characteristics. In the preliminary fermentation trials that followed, he was able to produce a Tannat wine with "increased fruit aromas and increased varietal character." Tannat is the signature variety of Uruguay.

Besides low-N yeasts and apiculate yeasts, Carrau also explored the diversity within *Saccharomyces cerevisiae* itself, looking for strains able to increase monoterpene formation, and strains with low ability to adsorb anthocyanins, which would result in wines with more color.

Carrau believes the application of a narrow number of commercial strains of yeast across the various regions of the world invariably results in uniform and boring wines. Instead, he believes there is a whole generation of yeasts with the potential to move in the direction of lower-input viticulture and winemaking, and to produce wines with more interesting aromas and better color retention. ■

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For individual summaries of these and other articles, see: http://wineserver.ucdavis.edu/trellissummary_categories.php

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2008 wine/grape research funding

Researchers working on solutions to U.S. grape and wine industry problems received increased funding of $2,007,083 in 2008 for 57 projects, up from $1,989,723 in 2007. The American Vineyard Foundation contributed $1,076,083, Viticulture Consortium West contributed $604,000, and California Competitive Grant Program for research in Viticulture and Enology contributed $327,000.

Research funds granted by topic include:

Breeding — 13 projects [$335,525];
Cultural practices — 10 projects [$339,293];
Disease management — 10 projects [$521,215];
Enology -- 11 projects [$512,000];
Education and outreach — 4 projects [$78,050];
Pest management — 4 projects [$221,000].

Research project, researcher, institution:

ABA and color — Matthew Fidelibus, University of California, Davis.

Amino acid levels and phenolic biosynthesis in skin and pulp of grape berries during ripening — Douglas Adams, UC Davis.

Analysis of sulfide off-odors produced during *sur lie* aging — Linda Bisson, UC Davis.

Aquaporin-regulated response of grapevine roots to salinity — Andrew McElrone, USDA-Agricultural Research Service.

Biology and management of Argentine ants in California vineyards — Kent Daane, University of California, Berkeley.

Breeding rootstocks resistant to aggressive root-knot nematodes — Peter Cousins, USDA-ARS.

Chemistry and biological activity of sex pheromones of obscure, longtailed, and grape mealybugs — Jocelyn Millar, University of California, Riverside.

Conservation tillage of cover crops to improve carbon storage in California vineyard soils; quantifying carbon sequestration potential — David Smart, UC Davis.

Coordinated wine grape variety evaluations in the western U.S. — Horst Caspari, Colorado State University.

Determining the role of fruit maturity in sensory properties of Central Coast Cabernet Sauvignon wines — Hildegarde Heymann, UC Davis.

Development of an enology outreach program — Linda Bisson, UC Davis.

Development of improved raisin grapes for mechanical harvest, including types resistant to powdery mildew; seedless grapes for the fresh market, including types resistant to powdery mildew — David Ramming, USDA-ARS.

Development of low-density PCR array (LDPA) for detection of pathogens in grapevine — Adib Rowhani, UC Davis.

Development of R-gene markers for biotic stress resistance breeding, and germplasm evaluation in grapes — Hong Lin, USDA-ARS.

Development of terminal restriction fragment-length polymorphism methods and databases, for comprehensive identification of yeast and bacteria communities in wine or winery environments — David Mills, UC Davis.

Durable powdery mildew disease resistance in *vitis vinifera:* proof-of-function and discovery of genetic variation — Lance Cadle-Davidson, USDA-ARS.

Effect of cluster temperature on composition of berries grown under field conditions — James Kennedy, Oregon State University.

Etiology and detection of the cause of Syrah decline in Syrah grapevine — Adib Rowhani, UC Davis.

Evaluation of new winegrape varieties for San Joaquin Valley — James Wolpert, UC Davis.

Evaluation of selected Mediterranean wine grape cultivars, and international varietal clones — Glenn McGourty, UC Cooperative Extension.

Evaluation of the impacts of in-row vineyard floor management practices on soil and water erosion, vine growth and productivity, weed control, and economics of wine grape production — Larry Bettiga, UCCE.

Evaluation of wine grape cultivars and clones for the San Joaquin Valley — Matthew Fidelibus, UC Davis.

Genetic diversity among grapevine viruses in the Pacific Northwest region — Naidu Rayapati, Washington State University.

Grapevine canker diseases — Doug Gubler, UC Davis.

Grapevine leafroll disease, a general detail study and evaluation — Adib Rowhani, UC Davis.

Grapevine powdery mildew control — revising the Gubler-Thomas Model — Doug Gubler, UC Davis.

Greenhouse gas budgets in a California table grape vineyard: conservation tillage of cover crops to improve sequestration of carbon into soils — David Smart, UC Davis.

Impact of malolactic fermentation on red wine color — James Osborne, OSU.

Improving yield and quality of Sauvignon Blanc — Glenn McGourty, UCCE.

Inception, diagnosis, and consequences of berry shrivel disorder — Ken Shackel, UC Davis.

Increasing the adoption of new knowledge, practices, and technology by grape producers through the Sustainable Ag Expo — Jill Whitacre, Central Coast Vineyard Team.

Influence of *saccharomyces cerevisiae* and *saccharomyces bayanus* yeast strains on color enhancement and color stability, in the vinification of Cabernet Sauvignon grapes from San Joaquin Valley — Roy Thornton, California State University, Fresno.

Influence of soil type and changes in soil solution chemistry during the growing season, on vine growth parameters and grape and wine quality — Jean-Jacques Lambert, UC Davis.

Influence of sun exposure and UV radiation on grapevine powdery mildew. Effects of UV-A and UV-B on airborne spore populations of *erysiphe necator* in the Pacific Northwest — Gary Grove, WSU.

Integrated management strategies and biology of rust mites in Oregon vineyards — Vaughn Walton, OSU.

Mealybug transmission of grapevine leafroll-associated viruses — Rodrigo Almeida, UC Berkeley.

Measuring vine transpiration using sap flow sensors: Validation/calibration of a new sap flow technique on large grapevines growing in a weighing lysimeter — Larry Williams, UC Davis.

Metabolic profiling of grape and wine aromas — Susan Ebeler, UC Davis.

Molecular genetic support to optimize the breeding of fanleaf-resistant rootstocks — M. Andrew Walker, UC Davis.

Oxidation of wine; control for quality — Andrew Waterhouse, UC Davis.

Production and management of aroma compounds by *dekkera/brettanomyces* isolated from wine — Linda Bisson, UC Davis.

Production of sensitive and specific antiserum for the diagnosis of grape viruses, using enzyme-linked immunosorbent assay — Mysore Sudarshana, UC Davis.

Relationship between nitrogen demand by fruit, nitrogen uptake, storage capacity, and water availability on fermentation dynamics — David Smart, UC Davis.

Remote sensing of grapevine stomatal conductance for irrigation scheduling — David Smart, UC Davis.

Reproductive biology of obscure, long-tailed, and grape mealybugs, and possible effects on detection, sampling, and control of mealybugs — Jocelyn Millar, UC Riverside.

Rootstock tolerance to soil salinity: impact of salinity on popular grape rootstocks grown in contrasting soil types — Jean-Jacques Lambert, UC Davis.

Search for, and development of, nematode resistance in grape rootstocks — Howard Ferris, UC Davis.

Seasonal biology of the Gill's mealybug, *Ferrisia gilli,* in foothill vineyards — Lynn Wunderlich, Ag and Natural Resources.

Spider mites in California vineyards: temperature tolerance, effects of plant water status through leaf temperature, impact of novel pesticides and resistance management — Nicholas Mills, UC Berkeley.

Sustainable control of vine mealybug, *planococcus ficus,* through conservation of natural enemies with selective insecticides — Nilima Prabhaker, UC Riverside.

Sustainable controls for vine mealybug; biological control — Kent Daane, UC Berkeley.

Understanding and increasing alcohol tolerance in wine yeasts — David Block, UC Davis.

Using marker-assisted selection to introgress powdery mildew resistance genes from different *vitis* resistance sources in wine grapes — M. Andrew Walker, UC Davis.

Verifying variety traits in the Davis grape genebank for inclusion in the National Registry — Ed Stover, USDA-ARS.

Viticulture extension seminars in San Luis Obispo and Santa Barbara counties — Mark Battany, UCCE.

Wine mouthfeel: the role of nonvolatile osmotic potential — Mark Matthews, UC Davis.

In Memoriam, Robert Mondavi

Robert Mondavi's death in May is a tremendous loss to the California wine industry of a pioneer vintner and wine promoter. ***PWV*** particularly recognizes Mondavi's efforts for innovation in winemaking, and education of those engaged in winemaking, as these efforts have contributed good practices to the pages of *PWV* for many years.

Early innovations to New World winemaking by Mondavi included the use of oak barrels for wine ageing, cold fermentation, and his fearless experimentation with new technologies for growing better grapes, and production of better quality wines.

His marketing efforts on behalf of his own and all California wines were tireless, highly successful, and widely adopted by many others in the U.S. wine industry.

At Robert Mondavi Winery and the many other wineries he founded and acquired over the years, Mondavi instilled this spirit of innovation and quest for the highest quality in the people who worked for him, many of whom have participated in, or contributed articles to *PWV* for the education of their peers in the industry.

Mondavi's endowments to the University of California, Davis campus will enable that school to enrich its viticulture and enology research and education efforts far into the future. ***PWV*** salutes Mondavi's lifetime of good work, and the fine legacy he has left for us all.

~Tina Vierra

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Three weed species have developed glyphosate-resistance

Horseweed likes to grow at the edge of the berm of vine row.

BY Lisa Lieberman

When developed in the 1974, many growers around the world thought that Roundup (glyphosate) was a godsend. It was one of the only non-selective broad spectrum herbicides that could be used to kill unwanted grasses and weeds without leaving residues in the soil that could affect non-target plants.

Over the past several years, however, three different species of weeds in California have developed resistant biotypes to glyphosate, including rye grass, horseweed (otherwise known as marestail), and most recently, hairy fleabane. The biotype of hairy fleabane found in the southern Central Valley in California is the first occurrence of glyphosate-resistant hairy fleabane in the U.S. There are 13 weed species resistant to glyphosate, worldwide.

Dr. Anil Shrestha (University of California integrated pest management weed ecologist, Parlier CA), first reported the resistance of horseweed to glyphosate in 2005. At first, Shrestha thought that horseweed, which is an erect winter or summer annual without petioles that can reach up to 6½ feet high, was mostly an aesthetic problem.

But in the past two years, Shrestha and his colleagues have conducted two studies indicating that horseweed could eventually cause yield losses in vineyards. Competition from horseweed could reduce vine growth, particularly in new vineyards.

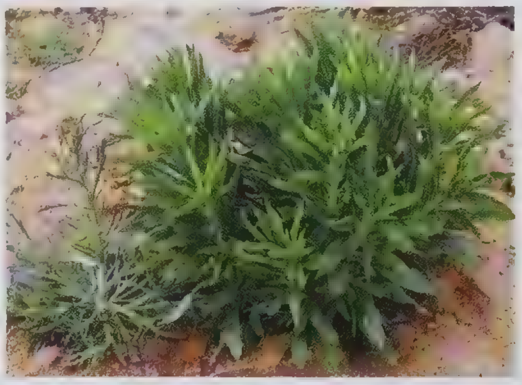
Shrestha has also observed that the horseweed population that is resistant to glyphosate was more vigorous than glyphosate-susceptible horseweed. The reason for this increased vigor is unclear. Shrestha along with Dr. Mathew Fidelibus (viticulture specialist), and Marisa Alcorta (graduate student), have been looking to see if the resistant and susceptible horseweeds have different competitive abilities with young grapevines and if the resistant horseweed would cause more damage to grapevines than the susceptible horseweed.

They are also conducting an experiment in a mature vineyard where they have planted horseweed in different densities between grapevines to see how many horseweed plants the grapevines could tolerate without suffering yield loss.

"But this mature vineyard has been kept clean for many years," Shrestha says, "so just having weeds in one year probably would not affect yield." The experiment will be repeated to determine the effects of the horseweed over time, including reduced yield.

Another problem with horseweed is its exceptional capacity to propagate rapidly. Each horseweed plant has 200,000 seeds that can be disseminated by the wind as far as one-quarter mile. Right now, it seems that glyphosate-resistant horseweed is spread evenly among Fresno, Kings, Tulare, and Kern Counties in the southern Central Valley. "However, it may not be surprising if it is already present in other counties in California," Shrestha notes.

Shrestha collected glyphosate-resistant and glyphosate-susceptible horseweed from these counties and applied glyphosate at one, two, four, and eight times the recommended rate. He found that the glyphosate-susceptible weeds



Hairy fleabane (left) and horseweed (right) are often found growing together in vineyards and orchards of California.

Ryegrass growing up through lumite mulch.

were mostly killed at the recommended rate.

Glyphosate-resistant horseweed, however, did not die until it was sprayed with four times the recommended dose. In a similar experiment with hairy fleabane, Shrestha found it took eight times the recommended rate to kill the resistant biotype.

Hairy fleabane, originally from South Africa, is a broadleaf weed similar to horseweed, with a more branching habit, and more abundant basal foliage. Like horseweed, it produces prolific numbers of seeds that can be spread by wind. In controlled experiments in South Africa, it was found that glyphosate-resistant hairy fleabane was not controlled by the recommended rate and that only 17% of the weeds were controlled at twice the registered rate of glyphosate.

Since the resistance of hairy fleabane to glyphosate has only recently been discovered in the U.S., it is too early to tell how much damage it could cause in vineyards. Researchers have done several experiments to study the best way to control horseweed and rye grass.

"Rye grass, which has some of the worst resistantance to glyphosate worldwide, started becoming a problem in northern California in the mid 1990s," reports Tom Lanini (weed ecologist at University of California,

Anil Shrestha is studying how quickly the glyphosate-resistant horseweed biotype (left) grows, compared to the glyphosate-susceptible biotype (right) even though they were planted on the same day.

Vineyard managers say the Bird Gard PRO Combo can be as effective as netting.

"Two years ago we got the Mega Pro. After the horrible 2004 season, with many vineyards getting little or no grapes, a 3 acre section of Reisling yielded 20 tons. Had the starling flocks been there, we would have lost $20,000-$30,000 worth of grapes," Vineyard Manager, Hazlitt 1852 Vineyards- Hector, NY

"I am delighted to tell you that we suffered less overall bird damage with the Bird Gard and Crop Gard combination this year than any year previous. In fact, the systems proved superior to the netting and cannons we used in the past," Woodward Canyon Winery-Lowden, WA

"I was very impressed to see the Crop Gard eliminate most of our bird damage. In 1999, we lost 5 tons of grapes due mostly to mocking birds. This year, using the Crop Gard we reduced our bird damage by 60% -75," Vineyard Owner, Certenberg Vineyards-Voca, TX

"Usually we loose 25%-33% of the Pinot Noir even with dawn to dusk patrol and 2 propane cannons. This year we lost less than 5 pounds of grapes. Based on Pinot Noir getting $1380/ton and Chardonnay $1000/ton, Foris Vineyards harvested an additional $3450 worth of grapes on15 acres," Co-Owner. Foris Vineyards Winery-Cave Jct., OR

Both the PRO Plus, the Super PRO and the Mega PRO have the chip in front so they can be easily replaced with new chips. The Mega PRO has 120 decibels of output and covers up to 30 acres. It's 60 times as powerful as the Bird Gard Super PRO ($550) that covers up to 6 acres. Included with the Mega PRO is a 200 watt amplifier, a 20 speaker tower, and a 40 watt solar panel. List:$3000. Our price:**$2200** plus shipping.

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Davis). "All rye grass has some level of resistance in California, but the rye grass in the northern parts of the state, especially in orchards and vineyards, seem to have the most problems."

In experimental tests, Lanini found that it takes 12 to 20 times the recommended rate of glyphosate application to control rye grass.

In newly planted vineyards, rye grass can be a real problem since it can wreak havoc on young vines. In more mature vineyards, rye grass has less of an effect, usually not lowering yields more than 5%. "In the worst case scenario, though, rye grass can reduce yields by as much as 20% in mature vineyards," Lanini adds.

Winegrape growers in northern California have tried many tactics to combat rye grass, including herbicides such as Chateau and Rely.

"Many growers want to get away from using pre-emergents and go to post-emergents — both from an environmental and economic viewpoint," Lanini observes. "Growers like Roundup because it is low-cost and effective."

The problem with Roundup, though, is that it's only been achieving 5% to 75% control of rye grass in the past few years.

"If you have 5% to 75% control, that means if you have 100 rye grass plants, you have anywhere from 25 to 95 plants that aren't getting touched," Lanini explains.

Lanini has found that 5.1 active ounces of Chateau per acre does an effective job of controlling rye grass. The best time to apply Chateau is when rye grass is between four to six inches tall.

"You want to apply Chateau after it's up and before it gets very big. Any earlier than that, you'll have problems with rye grass emerging later on. Any later than that, you have to worry about fall rains," Lanini adds.

Kurt Hembree, weed management farm adisor (UC Cooperative Extension in Fresno County), has been working with Shrestha and experimenting with chemical methods other than glyphosate to control horseweed. Hembree has found that materials such as 2,4-D and Rely seem to be relatively effective against the weed.

Rely, which has been commercially available for about four years, is a contact herbicide containing glufosinate ammonium. "With Bayer CropScience significantly reducing the cost of Rely in 2007," says Hembree, "it will be much more cost-effective for growers.

"While Rely is still a bit more pricy than some other post-emergent products, it is quite effective on a lot of weeds, especially horseweed. You can achieve at least 95% control of the horseweed with Rely if it is applied uniformly to weeds less than four inches tall."

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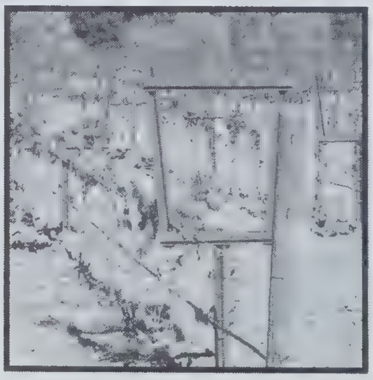

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Chateau (flumioxazin) is a relatively new commercial pre-emergent herbicide that is effective against horseweed, Hembree notes. But Chateau, at about $5 per ounce, is expensive. Allowable rates are 8 to 12 ounces per acre, with a cap of no more than 24 ounces per year.

Ideally, growers could apply 8 to 12 ounces of Chateau in the fall in a tank-mix with a grass-herbicide like Prowl H20 before weed emergence. Then, later in the fall, if they need to, they could use a tank-mix including Glyphosate, Rely, 2,4-D, or Paraquat to burn-down the emerged horseweeds that escape treatment, Hembree notes. Growers could make a second Chateau application to control weeds that might crop up in the winter months, followed by an additional post-emergent touchup treatment in the early spring.

The ultimate goal with these alternative treatments is to get growers not to rely on one product year after year, since that is what causes the resistance problem.

"If we can try some different approaches, we could lessen the risk of resistance to glyphosate over time," Hembree notes.

Although many growers tend to wait until weeds have become fairly visible in the field to spray, the key with horseweed is to apply post-emergent herbicides before the rosette stage (18 to 21 leaves).

"The important thing is to treat these things before they set seeds," says Hembree. "They are annuals and if you kill them, they will not produce any more seeds. But if growers wait until they start flowering, it is too late."

"We have also found that horseweed seeds are primarily surface-germinating types, and those seeds that are buried at depths as shallow as ¼-inch do not emerge," notes Shrestha. "Therefore, fall disking or soil disturbance could be a management strategy, as fall-disked fields in some locations in the central valley have been observed to have lower densities of horseweed in the spring."

The good news about horseweed is that, unlike some other weeds whose seeds can be viable for 10 years or more in the ground, horseweed seeds generally only survive for two to three years in the soil.

"If we can breakup the weed's lifecycle by not exposing it to the same modes of herbicide action every year, you can reduce the amount of horseweed resistance over time. Whether you're dealing with herbicide resistant weeds or not, it's important to use a combination of products or methods to maintain weed susceptibility," Hembree concludes. ■

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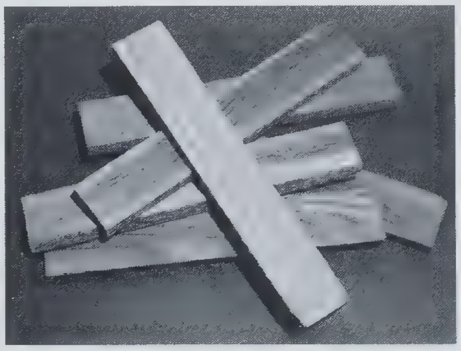

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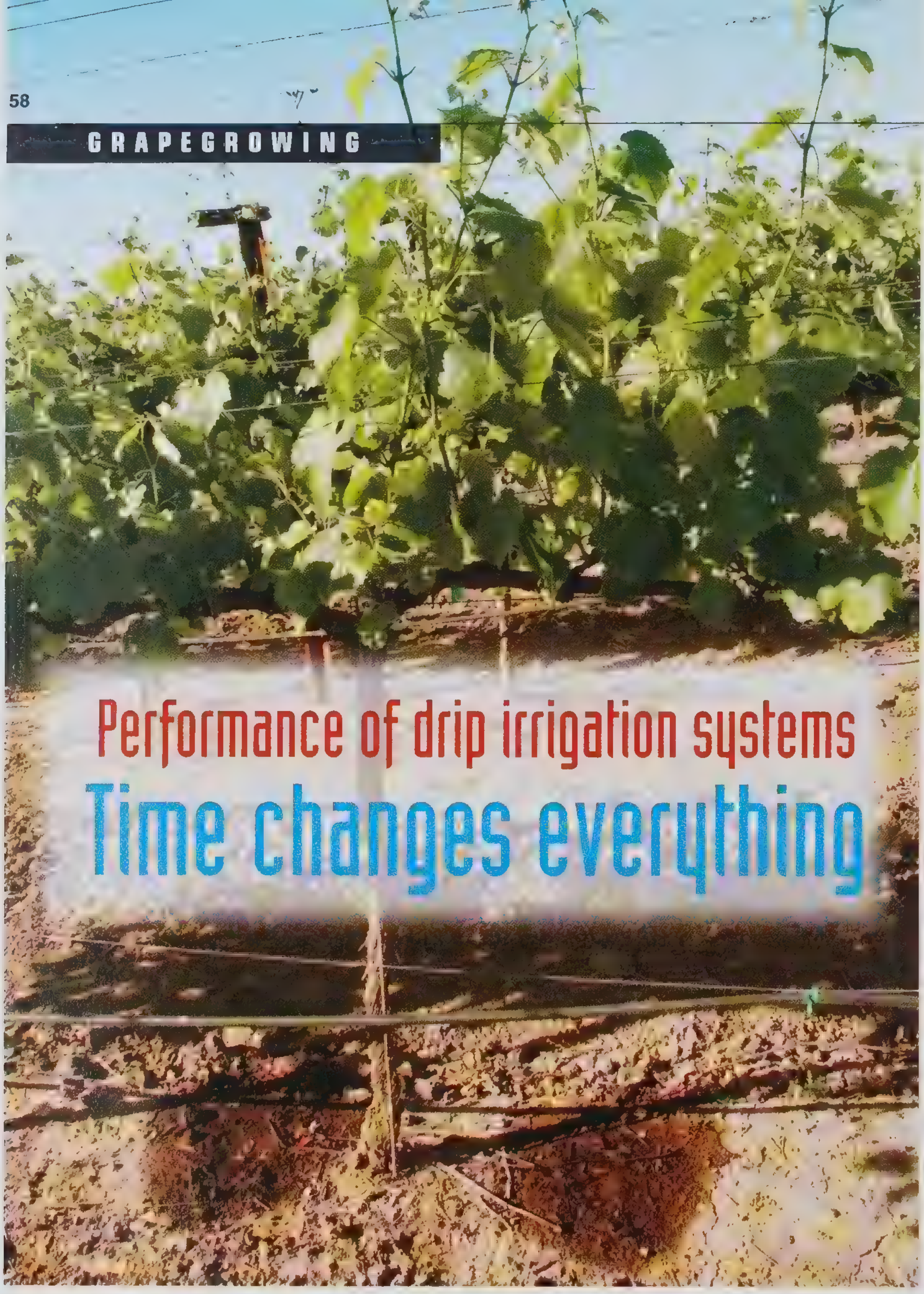

Performance of drip irrigation systems

Time changes everything

BY Ron Brase & Stephen Neal, Cal AgQuest Consulting

When an irrigation system is installed, it is designed to meet the water requirements of a specific crop. The design is based on a number of factors, including crop evapotranspiration (ET), pump flow (gallons per minute or gpm) and pressure capability, system pressure requirements, vineyard elevation changes, minimum distribution uniformity, soil infiltration rates, system operation, and cultural practices. All of these parameters need to be balanced in the design and cost of a system.

A well-designed irrigation system should have a minimum distribution uniformity (DU) of 88% or higher and be designed to deliver an adequate supply of water to the vineyard within a system runtime that is practical and manageable. If a system is so minimally designed that 24 hours of operation are required to meet daily crop ET in the middle of the summer, what happens if it breaks down? The answer is that the vineyard will be behind in irrigations and have a water deficit that will not be able to be made up until the peak grapevine water need passes.

The vineyard manager must keep multiple copies of the original irrigation design and layout, and the irrigator and system operators must also have copies and know how the system is supposed to operate. Design drawings should list the proper flow (gpm) and pressure requirements for each block or set.

During every system startup, make sure that the flow and pressure reading match the system design. If they don't, the system is in need of some service. Your original design drawing will be invaluable when you or a third party performs an assessment of the irrigation system or when repairs are made.

Over time, the operating characteristics of an irrigation system change — emitters frequently become plugged, pump flow rates drop, maintenance slips, and equipment deteriorates. These changes, plus other changes to operation (such as extra emitters installed or replacement of emitters with a different style or size), will change the operating characteristics and reduce system distribution uniformity.

Typically, with uneven water distribution, you will see smaller wetted areas at high points or near row ends, and sometimes swampy areas in the field, near low areas. Plugged emitters or free-flowing emitters can be found at any spot in the vineyard.

Such changes in the operating characteristics of an irrigation system can easily lead to a decrease in DU. A 10% drop in DU from the initial design means you need to increase irrigation runtime by 10% to deliver adequate water to grapevines in order to maintain yield.

If a drop in DU was due to partially clogged emitters that are now putting out 0.9 gallons per hour (gph) instead of 1.0 gph, it means that the runtime needs to be increased another 10% to compensate. If 1 gph emitters are being used at 88% DU, then 1.14 gph has to be put on to meet the water requirement (1.0 gph/0.88 = 1.14 gph).

If the DU drops to 78% and the lower quarter (25% of emitters) have an average flow of 0.9 gph, then you need to put on 1.46 gph to meet the crop water requirement of 25% of the vines (0.9 gph/0.78 = 1.46 gph), or 30% more water is needed. In this circumstance, it means the system must run 20% longer to apply the water and fertilizer to meet the needs of the grapevines.

The extra runtime to meet crop water and fertilizer needs will increase production costs, and the extra runtime does not necessarily solve the problem. You may have solved the underwatering problem on the lower quarter, but the rest of the vineyard is being over-watered and over-fertilized.

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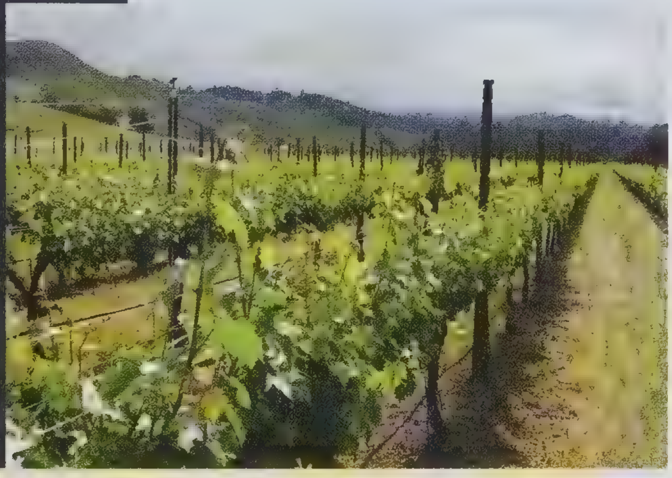

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Because time changes everything, it is very important to perform an irrigation system assessment every two to three years. This will provide the necessary information to determine the current performance of the irrigation system and tell you whether or not it is meeting the water requirements of the grapevines — or decreasing the yield and increasing operation expenses.

An irrigation system assessment should review, investigate, and measure the following items and practices:

Grower Interview, Pump, and Filter Station Inspection

- Interview with the grower/operator to determine system setup, layout, and operation (irrigation sets, irrigation times, and duration);
- System history, identifying problems;
- How the grower wants the system to run;
- Review of the design and system installation;
- Injection activities (fertilizers, gypsum, acid, chlorine, etc.);
- Vineyard layout, field size, number of rows and vines;
- Pressure readings before and after the filter station (inlet and outlet), pump, booster, and system operating pressure;
- Inspection of the filter station operation (flushing duration and amounts), layout, and valves;
- Notation of pump size, horsepower rating (electric or diesel), and gpm (flow meter or recent pump test); and
- A check of the water supply and injection equipment.

Field Inspection, System Setup, Layout, Pressure, and Flow Measurements

- Inspection of vineyard to check system operation and physical layout;
- Inspection of risers and inline screens for any clogging;
- Flushing of hoses and collection of samples to determine percentage of algae, sand, and silt accumulations;
- Inspection of emitters for calcium buildup, organic and/or sand-plugging;
- Estimation of the percentage of plugged and free-flowing emitters and a physical inspection of emitters to determine plugging issues;
- Check of vineyard for overwatered or dry areas;
- Measurement of emitter flow rates and taking pressure readings; and
- Measurement of pressure at the manifolds and at different elevations.

These field and station measurements are used to calculate the system performance, distribution uniformity (DU), system pressure requirements, and average emitter flow.

Irrigation assessments are provided by some Resource Conservation Districts, irrigation supply companies, and consultants, such as California AgQuest Consulting. If you choose to perform your own irrigation assessment, it is recommended that you take the Cal Poly State University (San Luis Obispo) 2½-day short course on Irrigation Evaluations.

To perform an irrigation assessment you will use the same tools that you should have on hand to maintain the system.

For Pump and Filter Station Assessment

you will need:

- Design drawings;
- Flow meter readings or recent pump test (less than two years old);
- Operating and correctly sized pressure gauges (0 to 30 psi, 0 to 60 psi) on inlet and outlet of filtration system (pressure differential across the filters should be 5 psi or less and the flush should start between 5 and 10 psi);
- Sight glass on filter station flushout line to determine proper filter station flush interval;
- Emitter flow rate, from design drawing or manufacturer rating;
- Number of emitters per vine; and
- Number of vines per irrigation set.

Multiply the emitter flow rate X the number of emitters per vines X the number of vines per set, to convert flow from gph to gpm.

- The gpm rate from the flow meter should match the calculated flow rate.

Field Measurements require the following tools:

- Pressure gauges (0 to 30 psi, 0 to 60 psi) — these sizes allow you to read low psi readings;
- Goof plugs and Pitot tube to measure line pressure;
- Pressure gauge chuck on pressure gauge to measure pressure at Schrader valves on manifold inlets;
- Several 16-oz cups to catch water from emitters over a minimum of three minutes per emitter;
- A graduated cylinder to measure flow; and
- A clear bottle to collect sediments from hose-ends.

Take emitter flow measurements from at least 60 locations per set. The locations should include the middle

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of the drip hose closest to the pump (16 readings), the middle of an average hose on an average main (16 readings), and the hose-end most distant from the pump (28 readings).

To find simple distribution uniformity (DU), calculate the average emitter flow, then divide the average flow by the average of the lowest one-quarter to determine the field DU.

Report of System Assessment by a third party

If you decide to have an irrigation assessment done by a third party, their report should provide a review of system operation, field measurements, and findings. The report should list problems found and recommendations for improvements.

The distribution uniformity for a system should be 85% or higher, and the flow rate for all emitters should be plus or minus (+/–) 5% at the same pressure. The filtration system pressure-loss across a clean filter from inlet to outlet should be under 5 psi, with automatic flush commencing at 5 to 10 psi.

The best pressure range for proper emitter operation is usually between 7 and 15 psi for non-pressure-compensating emitters. For pressure-compensating emitters, the best operating range is between 15 and 20 psi. Pressure-compensating emitters are usually installed on long runs or in vineyards with major elevation changes.

A proper Irrigation System Assessment may save time and money and has the potential to help increase yield. It will, most importantly, let you know how the system is performing and what changes are necessary to bring the system back to peak performance. ■

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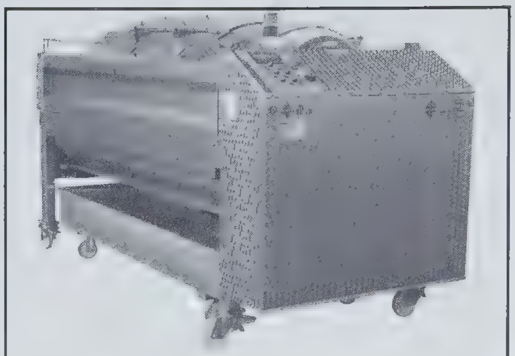

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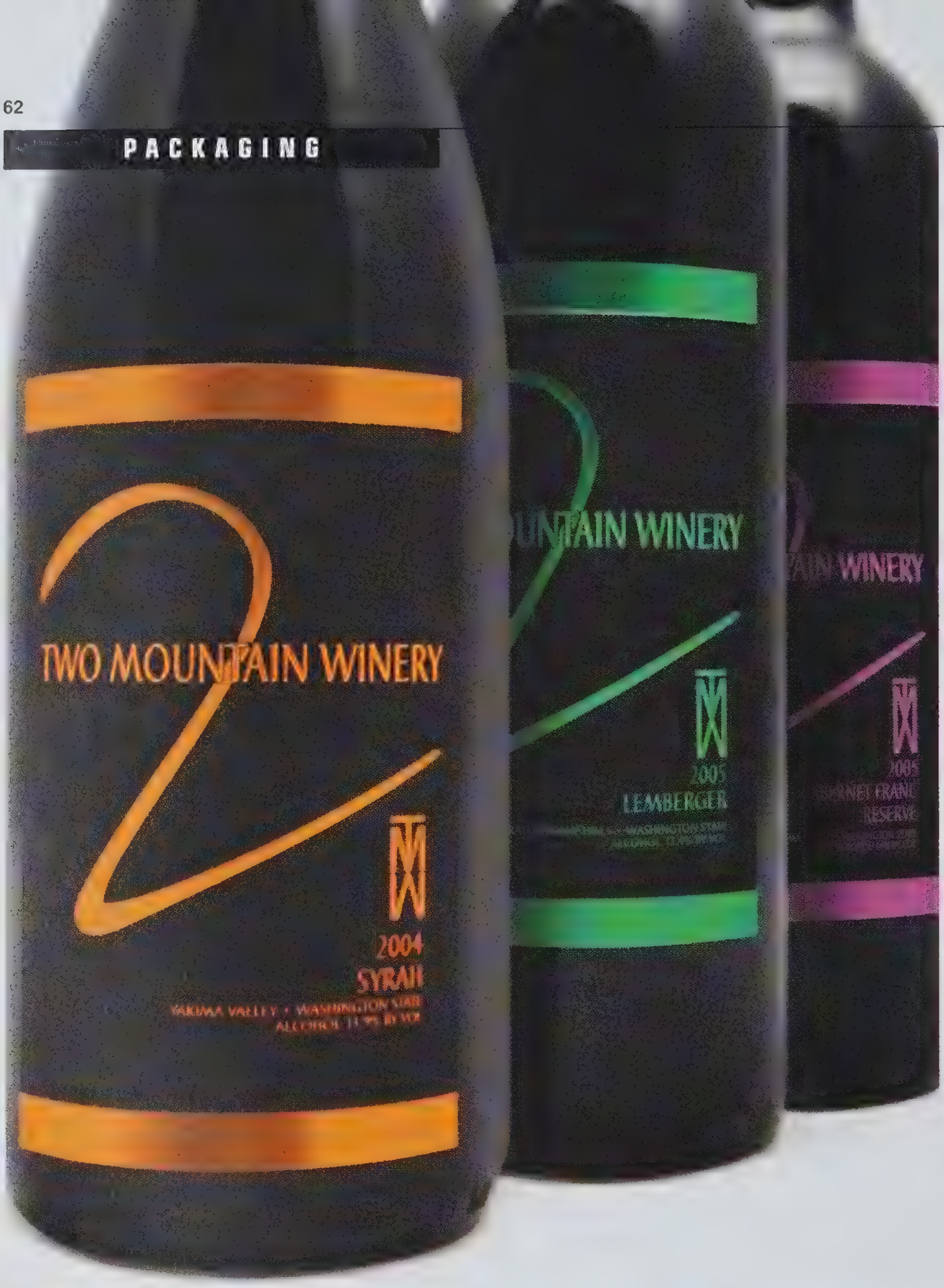

Next generation, new packaging

BY Tina Vierra

Two Mountain Winery in Washington's Yakima Valley launched its first vintage in 2002. Owner Ron Schmidt and his nephew Matthew Rawn had first planted vineyards in 2000. Matthew's brother Patrick joined them in 2004, and by 2005 production had risen to 3,000 cases per year.

In 2006, when their uncle died, the Rawn brothers bought the winery from their late uncle's estate, and started planning its growth. Patrick is general manager of the winery, overseeing 26 acres of vineyard, and shares sales and marketing duties with winemaker Matthew.

The Rawns decided that the next generation of the family-owned winery would have labels for Two Mountain Winery (TMW) that would bridge the gap between classic wine packaging and a contemporary look to appeal to new customers. "Time for the brand to grow up," states Matthew.

They brought back the designer of Two Mountain's original packaging, Deb Ashbeck (Richland, WA), who was enthusiastic about updating the brand. Ashbeck has worked with several wineries, developed the logo and marketing art for the Columbia Valley Winery Association, and designed food packaging for Whole Foods Markets and Costco Wholesale.

Patrick recalls, "We talked for hours about our goals and what we liked, what we wanted, what the package should portray with Deb. We had dozens of magazines; Matt and I had been collecting label materials we liked from other wines as samples. We wanted a label that looks contemporary but classic at the same time."

Ashbeck returned to her studio and produced ten mock-ups. Matthew reports the brothers tried them all out on everyone they knew. "We are not graphic artists," he laughs. "We took all the opinions we could get — our mom, girlfriends, neighbors, other wineries; they became our own unpaid focus group. Elements from nearly all of the original mock-ups made it into the final design. Near the end of the process, we put mock-ups of the semi-final choices in the tasting room and asked customers for feedback."

Label design completed

The end result is a matte-black label (on most of the wines) with bands of foil color at top and bottom, a crisply-elegant swash of the number "2," a cleaner version of the original TMW logo, and clean text elements similar to typefaces on the original label, for the winery name and wine information.

"We're not complicated people, so we didn't want a fussy or cluttered look for our wines," explains Patrick. "We wanted to pay homage to the past, so the original logo is there. We also wanted traditional wine industry elements like the bands at top and bot-

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tom. But we kept the overall look clean and simple."

The Rawns brought variation to the new look by changing foil colors on the labels according to wine variety. Labels on three flagship wines — Cabernet Sauvignon, Merlot, and Syrah — all have copper foil on a black background. The Cabernet Franc label has rose-colored foil, the Lemberger's foil is seafoam green, and the Red Table Wine's foil is red. The Riesling is in a blue bottle, so the label stock was changed to clear, and silver foil is used. The labels are printed by Metro Label Pacific (Langley, British Columbia).

Transition to the new labels began in October 2007 and was complete on all wines with the bottling of the 2007 Riesling, in March 2008. The winery is using the same glass and corks, although they'll be changing the capsules to custom foils with the updated TMW logo later in 2008. The Rawns bottle wine with a semi-automatic GAI 12-head monobloc into shiners, and then use a tabletop labeler and capsuler as they need finished packages.

Results with new package

The Rawn brothers have made sales calls with the new packaging and obtained immediate positive results. "Our retailers and restaurants were 110% positive about the new look. It's been extremely well-received," Matthew reports. Sales of the wines are up 41% over the same period in 2007.

"Over the next four or five years, we'd like to grow production to 6,000 or 7,000 cases, and hold it there," says Patrick.

One of Patrick's goals for the winery was achieved when the new packaging convinced some national and international distributors to take on Two Mountain wines. Once available only in Washington state, the wines were placed in four states and Japan in early 2008.

Next steps in re-branding

The brothers are continuing with the re-branding of Two Mountain Winery in sensible steps. Business stationery and the new website were launched in early June 2008, and design of further materials with the new look (sales kits, folders, rack cards) was under way, with printing planned for late summer and fall 2008.

"The most important step with the upcoming items is to cement the re-branding," Ashbeck notes, "with a consistency of design throughout all of Two Mountain's materials, including a marketing package with updated wine specifications and photography, a

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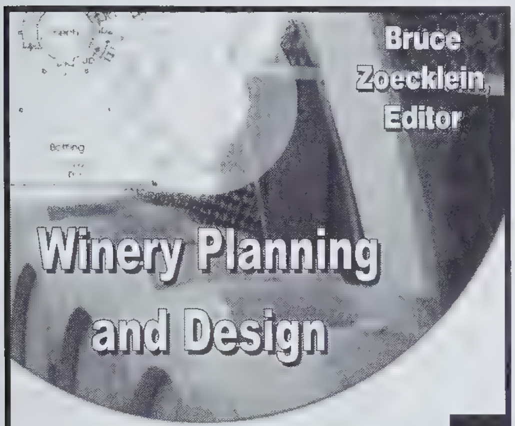
brochure with the winery story, and awards and events mailings in conjunction with Two Mountain's public relations agency.

"The goal of these materials will be to deliver Two Mountain's message, confirm the value of their wines, continue to build customer loyalty, and motivate their buyers." ■



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WINE MARKETING

Employing 100% winery-direct strategy in California

BY **Liz Thach, Sonoma State University**

With tens of thousands of wine labels available for sale in the U.S., increasing consolidation amongst distributors, and aggressive competition on the global market, moving to a 100% winery-direct strategy in California makes a lot of business sense. Not only can you achieve higher margins because there is no need to pay a middle facilitator, but you can also build stronger relationships with key accounts and increase brand awareness.

How difficult is it to implement such a strategy? The fact that very few wineries in California are doing this successfully — and those that are have long-established brands, such as Silver Oak, Hanzell, and Duckhorn — suggests that it may not be that simple.

Fortunately Grgich Hills Estate (Rutherford, CA), one of the most thriving wineries in this category, is willing to share "lessons learned" in employing a 100% winery-direct strategy in California.

Grgich Hills Estate overview

Violet Grgich, vice president of sales and marketing, and daughter of world-renowned vintner and founder, Miljenko "Mike" Grgich, described the origins of the strategy, how it has evolved through the years, and explained how it is being implemented today. She also provides tips and recommendations on how other wineries can expand winery-direct sales.

Founded 31 years ago in 1977, Grgich Hills was the brainchild of Miljenko "Mike" Grgich who crafted the celebrated Chateau Montelena Chardonnay that won the famous Paris Tasting of 1976 and helped put California wines on the world wine map.

Working with his partners Austin Hills and Mary Lee Strebl, Mike built the winery from the ground up. In the beginning, they purchased grapes to produce wine, but today all six of their grape varieties are 100% estate-farmed with biodynamic techniques. The 366 acres of producing vineyards were recently certified by Demeter — the international certifying organization for biodynamic farming.

Current production is around 70,000 cases with no plans to increase. "We want to pursue a stable strategy," explains Violet. "We only want to make a specific quantity of high-quality wines from our own grapes.

"We are currently about 65% allocated, and hope to be 100% allocated within one year. At the same time, we want to maintain positive relationships with our loyal accounts and continue to deliver them the necessary inventory to support their businesses."

Grgich Hills is most well-known for Napa Chardonnay, given Mike's long history with Chardonnay. Today, Mike's nephew, Ivo Jeramaz vice president of vineyards and production, assists in carrying on this tradition, supported by Gary Ecklin (chief enologist) and Kevin Vecchiarelli (assistant winemaker).

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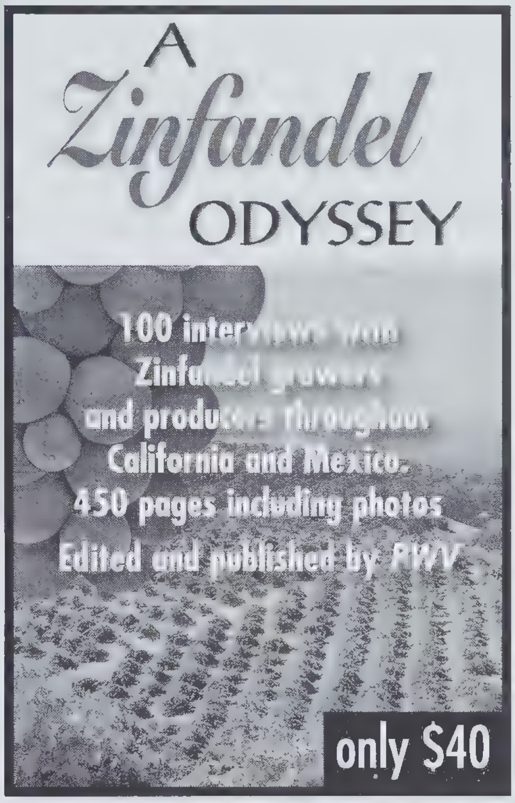
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Five other wines include Cabernet Sauvignon, Sauvignon Blanc, Zinfandel, Merlot, and "Violetta," a dessert wine made from botrytized Chardonnay and Riesling grapes. The last four varietals are small production lots and currently 100% allocated.

Retail bottle prices range from a low of $28 (Fumé Blanc) to a high of $150 for library vintages. The two largest volume wines are the Napa Valley Chardonnay ($40) and Napa Valley Cabernet Sauvignon ($60). The production by grape variety is: Chardonnay (39%), Cabernet Sauvignon (25%), Fumé Blanc (19%), Merlot (8%), Zinfandel (8%), and Violetta (1%).

Violet Grgich

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"Our goal is to make wines that are well-balanced, elegant, and subtle," explains Violet. "They are also food-friendly and long-lasting because they have a higher acidity than many other California wines.

"My father believes that wines should be absolutely delicious and made naturally, and that is the impetus for going biodynamic. He sees the wines as his children, and the good 'genes' come from vineyards which are not treated with pesticides and provide us with consistent high-quality fruit."

The Grgich Hills Estate winery is in Rutherford in Napa Valley. There are 37 full-time employees, and part-time employees are hired to help with the summer rush in the tasting room and harvest and crush.

Launching winery-direct strategy

Grgich Hills actually started their 100% winery direct strategy in California 30 years ago when they opened their doors.

"My father worked first for Robert Mondavi, and then Chateau Montelena before starting Grgich Hills," recalls Violet. "At that time, Chateau Montelena was selling all of their wine direct in California, so he was familiar with the process.

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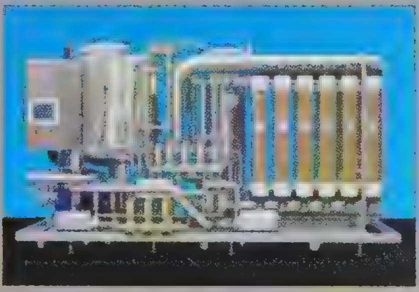

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"My father likes to say that the shortest distance between two points is a straight line, so we like to have a straight line to our customers. If you add more people, communications can break down and you may not be as effective."

A natural-born salesman and a brilliant winemaker, Mike began calling upon restaurants and retails shops in northern California. As new accounts came on line, he expanded further into Southern California.

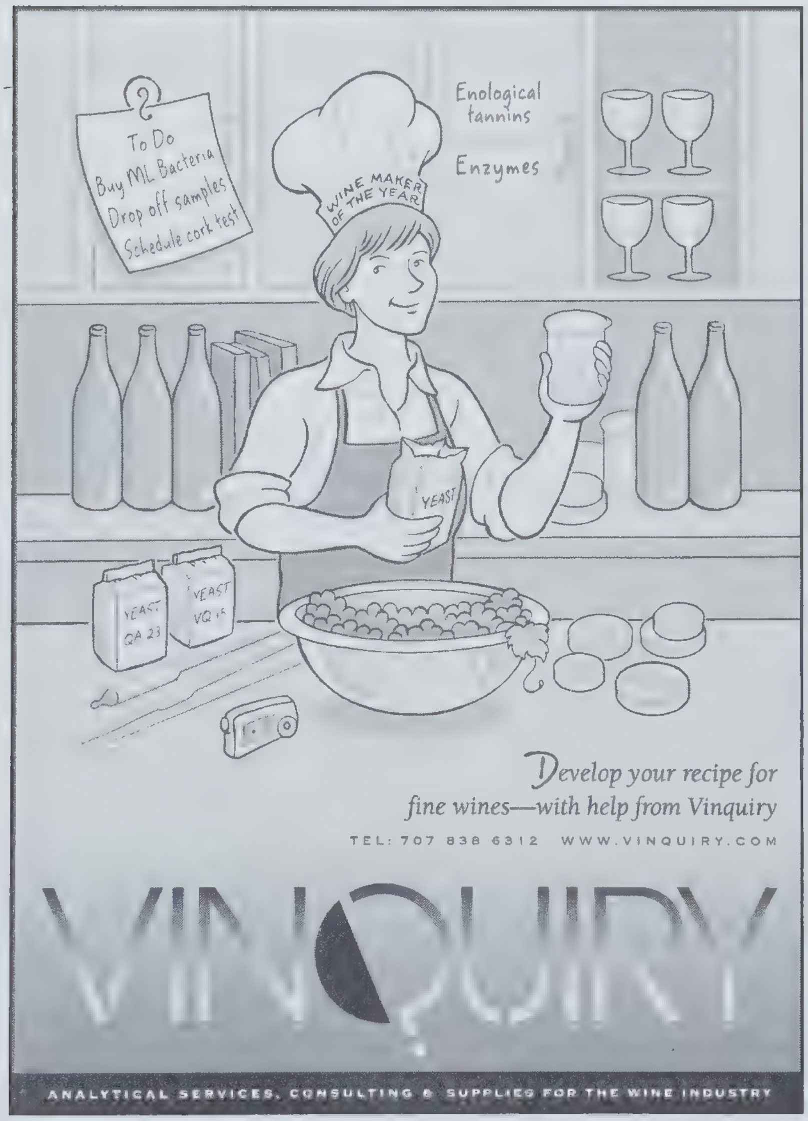
"We actually didn't hire a California sales manager until 1987," reports Violet. That manager then became responsible for managing all California accounts for 14 years. After he retired, they promoted Maryanne Wedner, the current California sales manager.

In 2007, Grgich Hills Estate has 3,537 direct accounts in California, with 2,314 (65%) being restaurant accounts and 1,223 (35%) in retail. Of those accounts, 40% are in northern California and 60% in the southern part of the state.

"We want to be in both restaurants and retail stores in order to make our wines available to our customers," explains Violet. "That is why we sell to Safeway and Beverages & More who have always treated our brand well. Although now, due to decreased production, a smaller amount is going to these larger retailers." Grgich Hills Estate is working to increase the amount of on-premise accounts.

Outside of California, Grgich Hills relies on a traditional network of distributors to sell their wine. "We are in all 50 states," explains Violet. "We have excellent working relationships with some distributors, and there are a few that we need to work with more closely. Although we would prefer to be direct everywhere, we work with distributors in the other states because at this time it would be too complex and not practical due to regulatory issues to attempt to sell direct outside of California." To manage this portion of the business, Grgich Hills Estate has one national sales manager, a midwest sales manager, and a northeast sales manager to work with distributors.

Altogether, Grgich Hills Estate is selling 41% direct to retailers and



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restaurants in California and 42% through distributors in the other 49 states. They sell approximately 13% direct to consumers via tasting room, wine club, and special events under the leadership of hospitality manager, Pam Harter and her staff. Wedner also oversees exporting which currently is about 4% of sales. Their best export market is Canada, but they also sell in the Caribbean, Mexico, and parts of Asia and Europe.

Staffing/managing the winery-direct approach

The organizational structure to handle a 100% winery-direct strategy in California includes three full-time people (who also process out-of-state and export, plus accounting), four sales representatives, and one commissioned broker. Grgich Hills has a major warehouse at the Rutherford winery, with a smaller shared space holding about 600 to 800 cases in Southern California with ABX in Van Nuys with other wineries who sell direct.

"Wedner manages the whole process, including sales staff and the broker," states Violet. Each salesperson is assigned a region. Only experienced wine salespeople are hired, with four of the five only selling 100% Grgich Hills wines. The broker (5&1; Sacramento, CA) also represents other wineries that do not compete with Grgich Hills. One or two of the in-house staff takes and tracks orders, and manages the data bases and handles customer service. Another person processes the orders to the warehouses and a third person does invoicing. This includes all orders for California, out-of-state, and export.

Once each year, an annual sales and marketing plan is created based on current production, past account history, allocated wine, and special customer needs.

"We start working on the plan several months in advance," reports Violet. "We like to have it completed by August 1, because our fiscal year begins September 1. Even though we have a plan, we like to be flexible and may change it to meet specific customer needs."

The four sales representatives and broker meet with Mike, Jeramaz, Wedner, and Violet at the winery several times each year to review the plan, exchange information, and learn about new happenings at the winery. "At a sales meeting in July," says Violet, "we took everyone out into our American Canyon vineyard to see our biodiverse farming."

The sales reps and broker have set allocations and sales goals for the fiscal year by wine variety, but do not have any other requirements, and are given much autonomy to make decisions on their own. "They are all very experienced," states Violet. "We don't want to micro-manage them. They know the accounts in their regions, and they are always keeping an ear open to learn

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about new restaurants, wine bars, or retails shops that we should call upon."

Sourcing of new accounts is accomplished through three methods: 1) word of mouth, 2) keeping updated on industry news via magazines, journals, the Internet, and other media, and 3) networking between themselves and other wineries that sell direct.

"Our sales people always stay in contact with one another and help each other," notes Violet. "They also learn of new business opportunities through reading magazines like the *Wine Spectator*, *Sante*, and others. There is a small, but active group of wineries that sell direct in California. We stay in touch with them and attend meetings. Everyone helps each other."

Grgich Hills defines an active account as one in which the client has purchased any amount of wine within the last 12 months. If the account becomes inactive, they contact them to determine if there are any issues, and win the account back, if possible. The sales people keep in contact with their accounts by visiting them in person as often as possible and telephoning them. Some accounts also use email and text messaging to communicate, but this is rare.

"One of the most interesting situations with an inactive account occurred when I just started out helping with sales," explains Violet. "I had a good restaurant client in San Francisco that was consistently ordering three cases of Chardonnay each week, and then he abruptly stopped. I knew something must be wrong, so I visited him personally.

"When asked about the situation, he explained that his customers were ordering too much Grgich Hills and none of his other Chardonnays were selling, so he canceled his placement! I thought it was strange that he would not offer his customers the wine they wanted to drink — ours — but I couldn't change his mind at that time. However, he did resume ordering from us the following week after I gave him a friendly reminder about how we contributed to his bottom line."

Sales logistics

When a broker receives an order from a client, he/she notifies the order-taker at the winery via phone, email, or fax. Accounts also directly contact the winery to place an order. Whoever takes the order, checks the account to verify the last shipment was paid for, and after approval, gives it to the order processor who notifies one of the two warehouses to process the order. It is then shipped via one of the contracted shipping firms: Zephyr, Express Wine Delivery, or ABX. If the order is received before 10AM, it is usually delivered within 24 hours.

The minimum order for free shipping is three cases. If a client orders less than this, there is an additional shipping charge of $5 per case. Occasionally there

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is an order for less than one case, and this is usually shipped via UPS — similar to direct-to-consumer orders.

Grgich Hills never discounts but does consider a limited amount of wine for a by-the-glass order as a sales promotion. With this discount, clients must agree to a minimum of a 90-day listing on the wine by-the-glass list and a three-case delivery.

When they find they are running short on a particular wine, they use a prioritization process to determine which accounts receive the wine. "Long-term restaurant accounts are first priority," states Violet. "Then, strong retail accounts. Establishments which discount our wine too frequently are cut off first."

Allocated wines are reserved for wine club members and long-term accounts. Grgich Hills keeps five to 15 cases of all vintages as library wines.

The brokers send weekly reports to Wedner. She reviews this and provides feedback and needed assistance. As California sales manager, she reviews sales and account information on a weekly, monthly, and quarterly basis, making any necessary revisions.

Challenges/Benefits to winery-direct

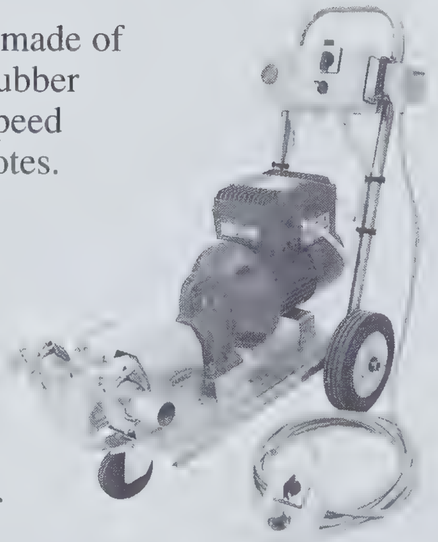
Since Grgich Hills Estate has been implementing their winery direct program in California for 30 years now, they have ironed out most of the issues. "We rarely have a problem with non-payment," says Violet. "We make sure to check credit history and do most initial orders as pre-pay or C.O.D. Many of our accounts have been with us for years, so we know them quite well."

It can be challenging to get new accounts. "It takes a lot of time and research to identify new prospects, get appointments, present the product, and follow-up," explains Violet. "Once you get the account you must continue to call on it on a regular basis or your will lose your placement. We are competing with some big distributors whose reps may have 10 accounts, so they are there almost every day."

Another important point is to make sure to continue to expand and enhance established relationships. This especially means listening to customers, asking for feedback, and being flexible in meeting their needs.

A different challenge is to keep the brand "fresh." This includes making sure accounts are aware of new happenings at the winery, including awards, new equipment, vintage variation, winemaking techniques, or other stories that will be intriguing to customers. Communications & Marketing Manager, Ken Morris makes sure all Grgich Hills employees involved in any type of marketing and sales activities receive the latest announcements.

Keeping the brand alive may also mean introducing new wines, as Grgich Hills Estate has done in the past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few years, with Merlot being the most recent new release. Mike Grgich also crafts a Plavac Mali red wine (not Zinfandel) and Posip white wine at his small winery in Croatia (opened in 1996). "It has been so successful that it sells out in that country almost immediately upon release," reports Violet.

For established brands, having the means to do a vertical tasting or wine dinners in key accounts can be very useful in promoting and strengthening the brand. Grgich Hills does wine dinners for special restaurant accounts and country clubs, trying to insure they can also sell wine through the events, either at the restaurant or club, or in partnership with a local retail shop.

There are many benefits according to Violet. "Although it takes much time, effort, and energy, it is worth it in the end from a financial perspective. In addition, you are much closer to your customers. They call if there is an issue and you can try to solve it immediately." This type of situation provides a competitive advantage in terms of exceptional customer service and response time in a very crowded and competitive market.

Advice to new wineries launching a winery-direct strategy

For a new winery with little to no brand recognition from retailers and restaurants, it is difficult to launch a winery-direct strategy in California, but not impossible. Violet offers these suggestions:

1. **Network with wineries who are currently doing winery-direct** — there are a number of wineries who are doing this successfully and most are quite open and friendly to newcomers seeking advice. They will have tips and suggestions on where to start and potential accounts that may fit a new brand.
2. **Be passionate about your brand** — the most critical success factor is a personal passion for your brand. In the beginning you, as the winery owner or winemaker, will most likely need to call on accounts with your broker or alone. An unflagging passion and optimism about your wine, along with some healthy perseverance will go much further than dropping off a press kit.
3. **Tell your story!** — positive reviews from wine critics are great, as are scores, but unless they are spectacular, you are liable to get lost in the shuffle. Telling your unique story with passion and establishing a personal connection with buyers and wine writers is the first step in building a relationship. It's much more long-lasting than getting a one-time sale or placement. Those stories are what servers and consumers will remember, and how your wine made them feel.
4. **Expect long hours in the beginning** — it is not easy to do direct sales and it requires many long hours on the road. It will necessitate identifying potential accounts, attempting to get an appointment, and then presenting your product in a positive light. Expect the first year to be especially challenging, but the situation should become easier as you build relationships and your wines are seen and tasted by others and are consistent in quality from vintage to vintage.
5. **Don't take rejection personally** — it is normal to receive a high number of rejections or vague "I'll get back to you" in the beginning. Don't take it personally. This is part of direct sales.
6. **Strive to continually improve** — after each visit with a potential new client, analyze what worked and what didn't in your meeting. Try to learn from others and continue modifying and improving your sales style and presentation — in order to learn something new. "This is one of the key points in being successful with winery direct in California," notes Violet. "As my father always says," grins Violet, "each day brings a new opportunity to learn something new. You should always continually strive to improve. This is particularly true in selling wine and keeping your brand fresh."
7. **Word of mouth** — build relationships with servers and wine stewards who directly sell your wine. Tell them your story. Make sure they taste your wine. They will be much more likely to make recommendations to their customers. ■

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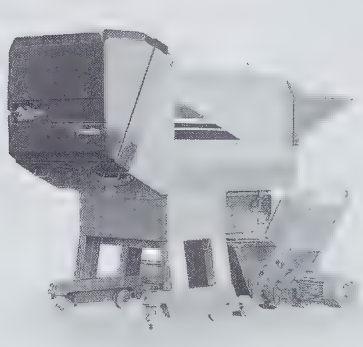

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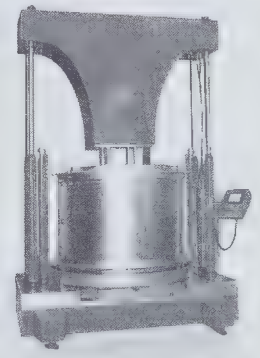

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New look for an old performer

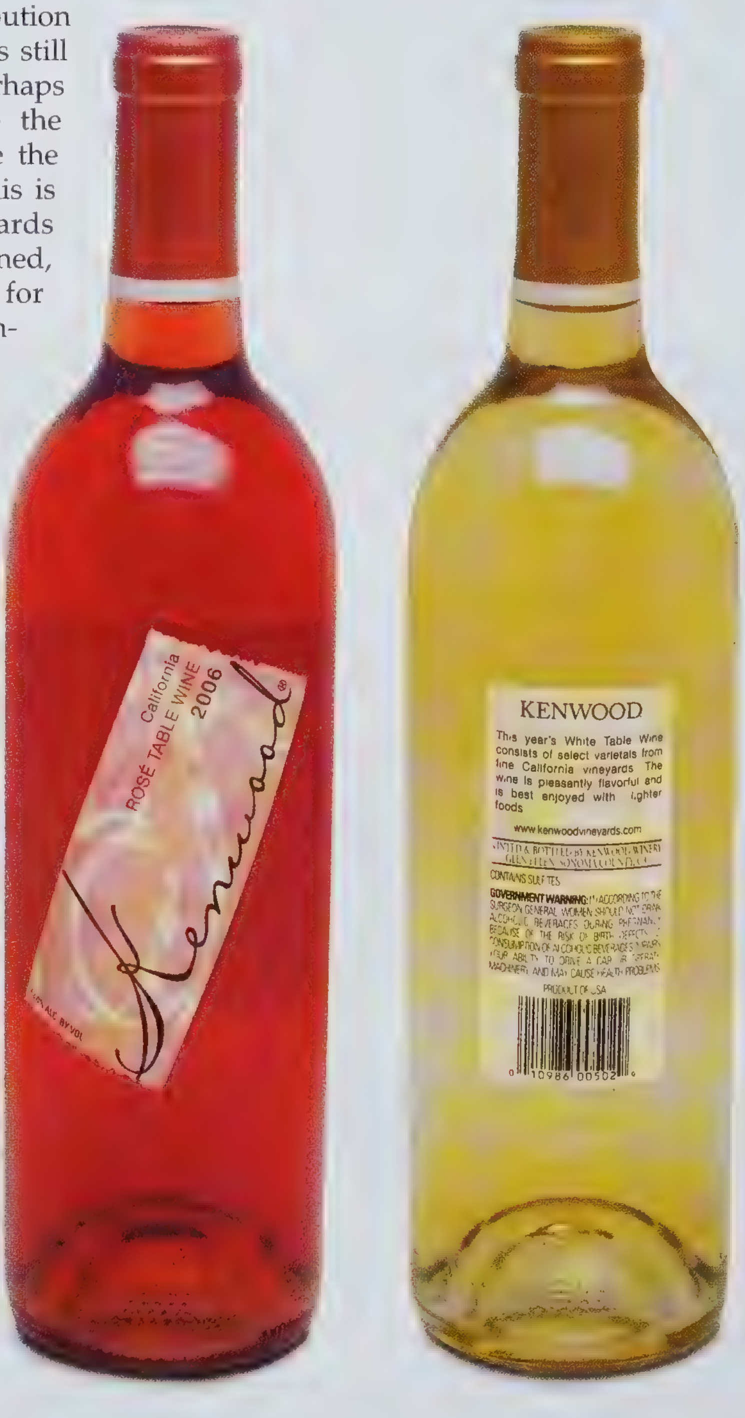
BY Tina Vierra

When sales of a firmly established wine brand start to go flat or decline, a winery should look for the problem. If it's not distribution or retail, and if the wines still appeal to consumers, perhaps it's time to freshen up the packaging and recapture the consumer's attention. This is what Kenwood Vineyards (Kenwood, CA) determined, and new packaging for Kenwood's former "Vintage Red" and "Vintage White" table wine blends was launched in 2007.

Produced at Kenwood since the 1970s, the table wine blends have always been good sellers, according to Paul Young, Kenwood sales director. Sales grew steadily through the 1990s in the packages designed by Colonna Farrell (now CF Napa in Napa, CA), but sales have gone flat in the last few years.

"I started seeing our 'Vintage' bottles placed on the bottom shelf in markets — that is never a good sign," Young recalls. "We were still doing great with the table wines in local northern California markets, but were dropped by some of the chains. Case sales in the tasting room were also strong."

The table wines have consistently been some of the best performers in the Kenwood portfolio. The Vintage Red, primarily Merlot, sells about 30,000 cases per year, while the Vintage White blends have either Sauvignon Blanc or Chardonnay as the primary grape from year to year, and sell about 10,000 cases. Consumer tastings showed Young and his marketing team that the wines were still well liked.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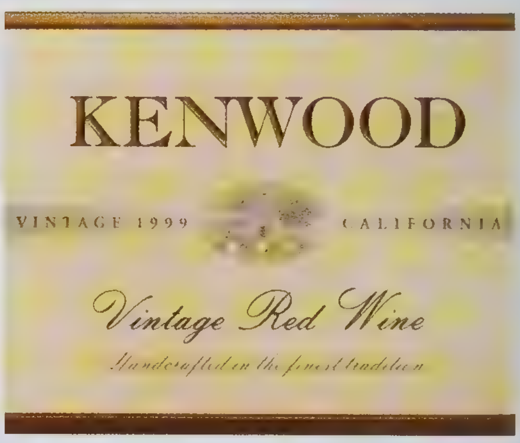
This year's White Table Wine consists of select varietals from fine California vineyards. The wine is pleasantly flavorful and is best enjoyed with lighter foods
www.kenwoodvineyards.com

Kenwood hired a firm in San Francisco, CA to form focus groups of consumers so the redesign team could gauge consumer interest and reactions to package design proposals. Young asked for a group of people age 40 and under, reasoning that Kenwood table wines were well established with older customers who were likely to remain loyal no matter the package, and it was new business that the Kenwood package needed to attract.

The first change adopted by the team under focus-group input was to remove the word "Vintage" — the new wines would be Kenwood White Table Wine and Kenwood Red Table Wine.

"Consumers told us they didn't need the word 'vintage' when the vintage year was on the label — they felt it was redundant," Young reports.



"Heck Arts Design submitted four initial design proposals, which we took to the focus group to test. The design finally adopted was the third most radical departure from our old look, and the #1 choice of the focus group."

Designers Aaron Heck and Aidan Sciandra drew the shape of the new labels from Aeropostale postal stamps,

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elongated with ragged-cut right and left edges, and reading from the south to north end of the label. Then at bottling, the pressure-sensitive labels (printed by Collotype Labels, Napa, CA, now owned by Multi-Color Corporation of Ohio) are applied at a diagonal.

"We tried to achieve a hand-applied look that elevates public perception of the quality of the table wines," Sciandra says. Young reports the winery used existing bottling equipment, but had to dial-in the change parts and work out some kinks the first time through.

The "Kenwood" logo script on the new labels was the first typeface change for a Kenwood logo since its inception in 1970. The designers also increased size and readability of the vintage date, and introduced a design-on-design element by repeating the script "K" in the background of the label.

"But once the customer flips the bottle around and looks at the back," says Young. "they'll know it's the brand they've always liked. We used a simplified version of the old Kenwood logo there, with the back label copy and layout they've been used to. Even the UPC codes are the same for the convenience of our continuing retailers. It offers history and reassurance to the returning customer."

With the rise in popularity of Rosé wines, the team decided to add Kenwood Rosé Table Wine, made from Merlot with a touch of Zinfandel. The sales plan is to push all three wines together into retail outlets as an inclusive portfolio program.

"The new table wines began shipping to retail and restaurant markets in June 2007, and sales are going well. The Red is up 10% over 2006 sales, to 33,000 cases," Young reports. "The White is up 6% to about 12,000 cases, and we sold 4,000 cases of the new Rosé."

Sales of the table wine blends were also strong in restaurant by-the-glass programs with attractive price-points, and Young's team was successful in placing them as the "house pour" at restaurants and golf clubs. Young reports that sales tracking shows the largest percentage of growth by region so far has been in the Northeast.

The sales team raised the price-point on the new releases in 2007 to $8.99 per 750ml bottle, and $6.99 on sale flyers. Young's strategy was to stay $1 retail under the main competition in the price category (brands such as Red Truck, and Bonny Doon's Big House White and Big House Red blends).

"Kenwood will not bottle our table wines in 1.5 liter size, as we believe it gives an impression of lower-quality wines with consumers," Young says.

The Kenwood winemaking staff produced conservatively in 2007, with enough for sales to grow 10% to 15% in 2008. If sales continue to accelerate, Kenwood will buy more grapes in harvest 2008 to increase production further. ■

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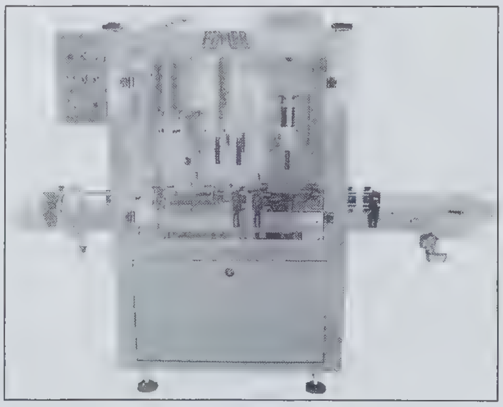

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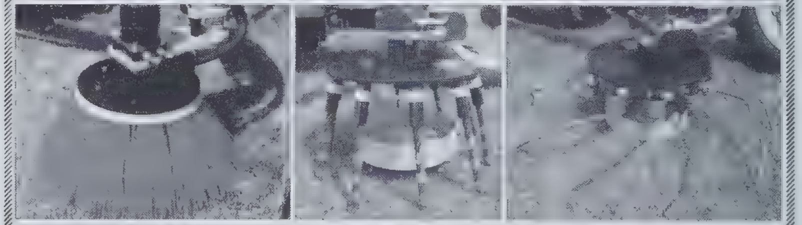

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July 31, August 1
Climate Change and Wine
Gloria Ferrer Winery — Sonoma, CA

This seminar will inform wine professionals of the observed impacts at all levels of the wine production and distribution chain and future projections. Mitigation and adaptation techniques are covered, for wine growing and winemaking to lessen predicted impacts.

The 1.5-day seminar is based on: Scientific data and results of the IPCC; Research conducted by Pancho Campo for his Institute of Masters of Wine dissertation; Proceedings of first and second World Meeting on Climate Change & Wine organized by Pancho Campo.

Seminar objectives:

- Understand the scientific basis of climate change in the wine industry.
- Learn the different impacts of climate change in the vineyard and winery in numerous wine regions.
- Understand the mitigation and adaptation process, its cost, social and ethical implications.
- Understand transportation issues, green house gas [GHG] emissions and consumer perception related to a possible new climate scenario.

PROGRAM: Lectures include presentations, interaction between participants and the presenter, and Q & A. The tasting session features wines from different regions and varieties that reflect the impacts of climate change and show some varieties with the potential to adapt to higher temperatures, drought, etc.

TOPICS: Scientific basis of climate change, Temperatures and precipitation, Huglin and Winkler Indices, Phenology and Climate Change, Pests and Diseases, CO_2 and GHG emissions in the wine industry, Alcoholic and Phenologycal ripeness, Transportation, Packaging, and CO_2 emissions, Mitigation, Adaptation, Financial, ethical, and consumer impacts.

Registration Fee $490 includes: Diploma of Attendance; two lunches; CD-Rom with course material; CD-Rom with Pancho Campo´s dissertation on climate change and wine; CD-Rom with proceedings of the II World Meeting on Climate Change and Wine (Barcelona 2008); 50% discount on registration fee for the "III World Conference on Climate Change and Environment in the Wine Industry 2010."

REGISTRATION — Please register online at www.climatechangeandwine.com, or contact: The Wine Academy of Spain, Paulina Campo, e-mail: info@thewineacademy.com.

August 27–29
World Sauvignon Congress
Graz, Steiermark, Austria

Sauvignon Blanc geography, geology, meteorology, genealogy, biology, chemistry, physics, psychology, social sciences, and culture will be covered.

August 27: Vineyard

Origin and heritage of Sauvignon Blanc cultivar — Ferdinand Regner (HBLAuBA Klosterneuburg, Austria); Climate + Sauvignon and changing climates — Richard Smart (Australia); How soils and climate determine Sauvignon Blanc flavor and aroma — Mike Trought, Marlborough Wine Research Centre (New Zealand); Impact of cultivation practices on Sauvignon Blanc grape composition + wine quality — Kobus Hunter, ARC Infruitec-Nietvoorbij (South Africa); Growth requirements of Sauvignon Blanc with respect to geographical location — Ulrich Pedri, Research Centre for Agriculture & Forestry Laimburg (Italy); Comparison of different types of Sauvignon Blanc clones — Jamie Goode, (Wineanorak.com UK); Laurent Audeguin, ENTAV-IT (France): Clonal research in France; Damian Martin, Winegrowers of Ara Ltd. (New Zealand): Clonal research in New Zealand; Wolfgang Renner, Research Centre for Vine & Fruit Growing (Haidegg, Austria): Clonal research in Austria.

August 28: Cellar

Impact of climate/enological practices on Sauvignon Blanc wine composition + quality — Johann Marais, ARC Infruitec-Nietvoorbij (South Africa); Impact of harvest on grape quality, wine type, and yeast activity — Wolfgang Renner, Research Centre for Vine & Fruit Growing (Haidegg, Austria); Comparison of indigenous and inoculated yeast ferments and influence on aromas and flavors of New Zealand Sauvignon Blanc — Matthew Goddard, Univ. of Auckland (New Zealand); Research in aromas and aroma precursors — Denis Dubourdieu, Univ. de Bordeaux (France); Biosynthetic pathways of precursors of important aroma compounds in SB berries — Chris Winefield, Lincoln Univ. (New Zealand); Maturation styles and ageing potential — Klaus Stumvollt, (Austria); Nicholas Lane, Cloudy Bay Winery (New Zealand).

August 29: Markets / Marketing

Should a wine region promote itself as a single-variety region? Larry Lockshin, Univ. of S. Australia; Sensory evaluation of Sauvignon Blanc wines — Wendy Parr, Lincoln Univ. & Marlborough Wine Research Centre (NZ); Greatness of Sauvignon Blanc — Joanna Locke MW, Institute of Masters of Wine (UK); Tim Atkin MW, (UK); Lynne Sherriff MW, (South Africa); Markets and Trends — Tim Atkin MW; Bartholomew Broadbent, Broadbent Selections (U.S.): What the American consumer and trade expect from Sauvignon Blanc; Gerhard Retter, Hotel Adlon (Berlin, Germany): What the German consumer and trade expect from Sauvignon Blanc; Eleonora Scholes, (Russia): What the Russian consumer and trade expect from Sauvignon Blanc.

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Saverglass launched a new production plant in Arques, France (June 2008), adding 40% capacity to its existing facilities in Feuquieres and Le Havre, producing a total of 300,000 tons of glass per year. Further expansions in 2008 have increased its integrated decoration capabilities, including innovative organic color printing lines.

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As wineries transition to screwcaps, winemakers are presented with new, unique challenges. Although screwcaps eliminate the concern of "cork-taint," screwcap bottles have a greater volume of headspace. Wine is exposed to oxygen trapped in the bottle headspace which, in turn, can result in increased dissolved oxygen levels, even after the cap is applied. Cryotech can help.

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Brick Packaging carries a full line of two-, three-, four-, or six-bottle carrier packs.

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Since 1989, Castoro Bottling has served wineries throughout California with a fleet of high-tech mobile bottling lines. The demand for Castoro Bottling's timely, professional, and knowledgeable service has triggered the bottling of over 48 million bottles of wine with natural cork, synthetic corks, and screwcaps.

Castoro Bottling offers three technologically-advanced mobile bottling lines that arrive on schedule to serve all bottling needs. Castoro Bottling can bottle up to 2,500 cases per day, serving any size winery. A number of custom services are offered, including labeling and packaging consultation. Recognizing the need for wineries to offer alternative closures, Castoro Bottling has outfitted two bottling lines with screwcapping and Zork capability. Castoro Bottling can handle 187ml bottles.

"Our investment in the best equipment and the best people to run that equipment sets Castoro Bottling apart," says Niels Udsen, owner. "We anticipate the needs of a winery better than any other bottler simply because I have owned and operated a successful winery for over 25 years. Castoro Bottling is a partner who knows and understands your business."

Since 2005, Castoro Bottling Company has offered Velcorin dosing. Please call or visit the website.

For more information, contact:
Castoro Bottling Company
Niels Udsen
PO Box 954, Templeton, CA 93465
tel: 805/467-2002; fax: 805/467-2004
e-mail: Niels@castorobottling.com
website: www.castorobottling.com

PLEASE SEE CASTORO BOTTLING AD, PAGE 29.

CORTICA BENICIA USA

Cortica Benicia USA (CB USA) produces and distributes a large variety of corks, from very small tapered corks to champagne corks, wine corks (to fit any bottle), bar tops (with both plastic and wooden tops) and more. CB USA will print, stamp, and/or color corks to match most designs. CB USA corks are scrutinized using the most sophisticated equipment available, and are very reasonably priced.

The laboratories of CB USA are state-of-the-art, analyzing corks of the highest quality. They are equipped with the latest mechanical, chemical, and sensory devices to ensure the very best product available. CB USA provides innovation and technology with an eye to sound environmental and ecological protection.

CB USA supplies capsules (PVC and polylaminate), and screw caps in a myriad of colors. CB USA provides wax in solid colors and metallics, including three different golds and two silvers, and will match any color provided. CB USA stocks wood boxes in many configurations, and can produce custom-designed boxes.

For more information, contact:
Cortica Benicia USA
6600 Goodyear Rd., Benicia, CA 94510
tel: 800/532-2207; fax: 707/747-1624
e-mail: info@cbcork.com
website: www.cbcork.com

PLEASE SEE CORTICA BENICIA AD, PAGE 43.

ALCAN PACKAGING CAPSULES OF CALIFORNIA

Alcan Packaging Capsules of California is committed to serving wineries with top quality capsules (tin, polylam, sparkling), and STELVIN® screw caps.

Since 1985, Alcan Packaging Capsules of California, located south of Napa, has been producing tin, polylam, and sparkling capsules, and is the only supplier in the U.S. market to produce these capsules at a Napa Valley plant. The Alcan team is devoted to providing the best service.

First in the wine market with the revolutionary STELVIN® screw cap, Alcan Packaging Capsules introduces another innovation, the STELVIN® LUX, answering an ongoing need to enhance packaging. Alcan has developed a proprietary plastic insert underneath the outer capsule so that no threads show after sealing, providing a large printing surface for the most elaborate designs (top embossing, side printing). Please contact Alcan regarding bottling line equipment for use with the STELVIN® LUX.

Alcan is committed to excellence in Environment, Health, and Safety. Alcan's goal is to protect and promote all communities where the company operates. The American Canyon, CA plant is certified ISO 14001 and OSHAS 18001.

For more information, contact:
Alcan Packaging Capsules of California
5425 Broadway St.
American Canyon, CA 94503
tel: 707/257-6481; fax: 707/257-8028
e-mail: tarah.betinol@alcan.com
website: www.stelvin.alcan.com

PLEASE SEE ALCAN AD, PAGE 63.

CALIBER WINEPAK

Caliber WinePak brings the bottles to the winery! To see a comprehensive selection of bottles, request Caliber WinePak's Mobile Bottle Showcase to visit the winery or office. If a unique project requires design capabilities, Caliber WinePak has an award-winning design group that can bring the winery's vision to fruition.

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Since 1982, Caliber has supplied packaging with an eye to success by providing viable options to customers. Caliber WinePak was first to bring antique green bottles to the domestic market; produce domestic Stelvin-finish wine bottles; and develop domestic versions of imported wine bottle styles.

Options do not punch a time clock. Search www.caliberwinepak.com for 24-hour access to a large library of packaging information. Options are what make the seemingly impossible, possible. Caliber WinePak brings you the most packaging options available in one place.

From the spark of the idea to the wine on the shelf, contact Caliber WinePak … "Because Our Options Make the Difference."

For more information, contact:
Caliber WinePak,
a division of TricorBraun
603 Indiana St., Benicia, CA 94510
tel: 707/747-1055; fax: 707/291-4387
e-mail: pblanchard@caliberwine.com
website: www.caliberwinepak.com

PLEASE SEE CALIBER WINEPAK AD, PAGE 73.

AMORIM CORK AMERICA

Amorim Cork America is the U.S. subsidiary of Amorim and Irmãos of Portugal, the world's largest manufacturer of natural cork wine closures. Amorim Cork America provides sales, service, and custom finishing services to wineries throughout the U.S.

Amorim's quality assurance standards are the highest in the industry. In addition to offering ROSA, a proprietary steam-distillation treatment to reduce TCA, the company is the first to offer sustainable FSC- certified cork closures.

AMORIM CORK AMERICA

Amorim Cork America offers a full line of natural cork products:

Natural straight cork in standard 24mm diameter; 38mm, 45mm, 49mm, 51mm, and 54mm lengths available in two washes: BWC or Natural.

Spark® cork, designed for sparkling wine and utilizing INOS II-washed disks to eliminate off-aromas.

Twin Top® cork, a closure with an agglomerated mid-body with a ROSA-treated disk at each end, widely accepted for its consistency of size, performance, and sensory neutrality.

Colmated cork, a high-quality, low-cost alternative for wines meant for early consumption.

Neutrocork®, a micro-agglomerated closure made of ROSA-treated particles that make it price-competitive while maintaining excellent sensory values.

Amorim Cork America is a member of the Cork Quality Council. All corks are subject to GC/MS testing for TCA at ETS Laboratories prior to acceptance into inventory.

For more information, contact:
Amorim Cork America
2557 Napa Valley Corporate Dr., Ste. A
Napa, CA 94558
tel: 707/224-6000; fax: 707/224-7616
e-mail: info@amorimcorkamerica.com
website: www.amorimca.com

M.A. SILVA CORKS USA

The SARA® Granulated Cork Sanitizing System is M.A. Silva's new automated system for removal of TCA and other polyphenols in granulated cork. Testing shows a consistent reduction of 80% in the average level of TCA in the cork material.

The SARA® system is a continuous process that utilizes two linked processing chambers. The upper chamber sterilizes the cork material with pressurized steam. The TCA and other polyphenols are volatized and exhausted directly from the chamber. A worm-shaft continuously circulates the cork granules in the steam chamber to ensure thorough and consistent processing. From the steam chamber, the cork material flows into the drying chamber, where dry hot air evenly reduces moisture content to specification for agglomerated, Silktop® 1+1, and Champagne cork manufacturing.

For more information, contact:

M.A. Silva Corks USA
3433 Westwind Blvd., Santa Rosa, CA 95403
tel: 707/636-2530; fax: 707/636-2531
e-mail: info@masilva.com
website: www.masilva.com

RAMONDIN USA, INC.

As a leading worldwide supplier of quality tin capsules, Ramondin has the latest innovative products and production capabilities to make truly world-class packaging. Ramondin has been making capsules for the wine industry since 1890. Ramondin was the first tin capsule manufacturer to receive ISO 9001 certification, complying with strict standards of quality, safety, and service, and the ISO 14000 certificate, which has special emphasis on protecting the environment.

Customized modifications to Ramondin's printing machines have created a proprietary production process, which allows printing of virtually anything imaginable.

Ramondin has implemented a reuse/recycling program. Recyclability is one of tin's great merits. Ramondin's recycling program encourages wineries to return plastic trays for reuse in new tin capsule orders. Tin is an excellent replacement for environmentally undesirable metals and plastics. Ramondin buys the purest tin and processes the metal into the perfect closure. Ramondin's continued commitment to protecting the environment has led to development of water-based paints — no more solvents.

When designing new packaging, Ramondin can advise which capsule is best with a given label. If only bottling small wine batches, ask about Ramondin's stock capsules.

For more information, contact:

Ramondin USA, Inc.
2557 Napa Valley Corporate Dr., Ste. G
Napa, CA 94558
tel: 707/944-2277; fax: 707/257-1408
e-mail: ramondinusa@ramondinusa.com

PLEASE SEE RAMONDIN USA, INC. AD, PAGE 5.

A.O. WILSON LTD.

Now in its 63rd year of serving the alcohol beverage industry, A.O. Wilson offers a variety of packaging supplies and equipment.

Bottle finishing and decorating:

1. neck/full bottle sleeve decoration
2. PVC heat-shrink bottle capsules
3. foil and polylam champagne hoods
4. pleated bottle foils
5. dipping wax
6. wine bags and boxes (bag-in-box)
7. bottle netting
8. wine bottles

Closures:

1. natural corks: tee corks, still wine corks, Champagne corks
2. ROPP closures
3. Stelcap aluminum caps for BVS bottle finishes
4. crown caps
5. plastic caps
6. Pfefferkorn plastic stoppers — for sparkling wine, still wine, or custom-designed caps
7. muselets — for plastic stoppers and Champagne corks

ao wilson

Packaging equipment:

1. hand-held shrink gun for PVC capsules
2. pressure-sensitive labeler
3. capsule dispensers
4. bag filler
5. pressure filler

Please contact A.O. Wilson to discuss your future screw cap plans, capsule, foil, cap, bidule, cork, or wirehood requirements.

For more information, contact:

A.O. Wilson Ltd.
PO Box 820, Bolton, Ontario
Canada, L7E 5T5
tel: 905/857-1511; fax: 905/857-0325
e-mail: aowilson@on.aibn.com
Western U.S. and Canada
Hubert Oliver
tel: 250/764-2645
e-mail: hsoliver@shaw.ca
website: www.aowilson.ca

PLEASE SEE A.O. WILSON AD, PAGE 79.

CorkTec

CorkTec better serves the East Coast and North America by receiving stoppers directly from Portugal, saving both time and money on the delivery of cork stopper inventory.

CorkTec has between one and two million stoppers in a Connecticut facility ready for branding with a customer's logo. CorkTec's large inventory and new equipment will ensure on-time delivery and the ability to respond immediately to each customer's needs.

The Stafford Springs, CT facility is a newly constructed, climate-controlled clean room, which contains the latest state-of-the-art branding, treatment, and packaging equipment in the industry. The Connecticut facility has an internal quality control laboratory and an extensive QC program. Although CorkTec's stopper inventory is tested by an independent laboratory in Portugal, CorkTec performs a series of additional tests to ensure the customer receives the best quality stoppers.

CorkTec's mission is to supply the growing market of small, medium, and large wineries and vineyards by processing small to large orders with minimal lead times.

For more information, contact:
CorkTec
17 Middle River Dr.
Stafford Springs, CT 06076
tel: 860/851-9417; fax: 860/749-3478
e-mail: sales@CorkTec.com
website: www.CorkTec.com.

Bergin Glass Impressions

Bergin Glass (BGI) has provided premier glass decorative services to the wine industry since 1988. BGI built its reputation on creating high-end artisan work, beginning with etched and hand-painted wine bottles. This decorating option has been almost exclusively reserved for large format sizes — 1.5L to 27L.

BERGIN
GLASS IMPRESSIONS

In 1996, BGI added decorative services of direct screen-printing and decal applications. Screen-printed wine labels are produced on one-color, two-color, four-color, or six-color machines. Direct-screen printing has grown in popularity as the wine industry becomes more knowledgeable on the merits and benefits of this type of packaging. Direct-screen printing allows designers and wineries to be bolder and more creative in label design, by allowing more use of the overall bottle surface — front and back.

Production managers and winemakers welcome screen-printed bottles, because they do not create disruptions on the bottling line. Labels can never be scuffed, applied crooked, wrinkle, or appear to bubble and fog (think pressure-sensitive).

In June, 2008, BGI added a fully automated six-color print machine to their production line-up, providing more capacity to serve the continued growth of the wine industry.

For more information, contact:
Bergin Glass Impressions
2511 Napa Valley Corporate Dr., Ste. 111
Napa, CA 94558
tel: 707/224-0111; fax: 707/224-4185
e-mail: mike@berginglass.com
website: www.berginglass.com

PLEASE SEE BERGIN GLASS AD, PAGE 65.

ZORK USA

Package your point of difference. ZORK is a wine closure that delivers innovation, design, and functionality that solves the problems of cork taint and random oxidation.

ZORK®:

- Consistent and predictable oxygen transmission rate (OTR).
- ZORK will not leak, taint, or contaminate wine.
- ZORK is easy to apply and works with a variety of filling/capping equipment.

- In independent consumer acceptance research conducted by a major U.S. wine company, a majority of respondents ranked ZORK in the top three in preference of available wine closures, ahead of cork and screw caps.

For more information, contact:
ZORK USA
951 Douglas Rd., Batavia, IL 60510
toll-free: 866/996-9675; fax: 630/406-8442
e-mail: info@zorkusa.com
website: www.zorkusa.com

SCOTT LABORATORIES, INC.

Scott Laboratories is one of the oldest American suppliers of packaging materials to the North American wine and beer industries. For over 50 years, it has been on the leading edge of the industry — emphasizing quality, service, and innovation. Scott Labs offers a broad range of products, including natural corks, screwcaps, champagne corks, and wirehoods.

Scott Laboratories is a founding and continuing member of the Cork Quality Council, working to control and eliminate TCA in corks. Scott screens all corks for TCA using SPME machinery in Portugal and at ETS Laboratories.

Scott Laboratories offers Alplast Chiusure SpA screwcaps that have a broad range of artwork possibilities, such as hot stamping, and printing using lithographic and offset processes. Several liner options are available.

For champagne corks and wirehoods, Scott Laboratories continues its long-term relationship with Relvas Corticas and ICAS SpA. Relvas Corticas is unique among champagne cork suppliers – all wood is purchased directly from the forest, and all materials are sourced and processed in-house. ICAS is the world's largest and most advanced producer of wirehoods, and the leading supplier in Europe, North America, and Australia.

For more information, contact:

Scott Laboratories, Inc.
PO Box 4559, Petaluma, CA 94955
tel: 707/765-6666; fax: 707/765-6674
e-mail: info@scottlab.com
website: www.scottlab.com

PLEASE SCOTT LABORATORIES ADS, PAGES 39, 56.

WS PACKAGING GROUP, INC.

The WS Packaging Group San Luis Obispo, CA facility specializes in wine label production, and is one of the few label printers offering both pressure-sensitive and sheet-fed glue-applied labels from the same facility, utilizing UV flexographic, digital, offset, and web-offset production.

WS Packaging Group's focus in San Luis Obispo focus is ultra-high-end wine labels, meeting discriminating winery demands with exact color matching, tight registration, metallic foil application, sculptured embossing, intricate die-cutting, hexachrome color process, and just-in-time delivery.

WSP has multiple manufacturing facilities across the U.S., and over 70 sales representatives for local and regional sales and service.

For more information, contact:

WS Packaging Group, Inc.
1102 Jefferson St., Algoma, WI 54201
tel: 800/340-3424 x6231; fax: 920/487-7074
e-mail: tdeegan@wspackaging.com
website: www.wspackaging.com

SPARFLEX CALIFORNIA

Sparflex California, is a subsidiary of the Sparflex Group. The Sparflex Group incorporates five manufacturing facilities for capsules and sparkling wine foils in France, Germany and in the U.S. (Ukiah, CA). Sparflex specializes in tin capsules; aluminium capsules; polylam capsules; PVC capsules; foils for sparkling wine, and wirehoods.

Sparflex has very complex and detailed design capabilities in its product portfolio. Polylam capsules can be printed with up to seven colors on the side. Foils can be embossed, hot-stamped, or have heliographic multicolor designs on the head and skirt. A technique that allows a two-color embossing juxtaposition on the head of tin capsules has been developed.

Sparflex had two facilities in California with stock on-hand of tin and polylam capsules, foils, and wirehoods in several colors and sizes.

Sparflex is represented by Pickering Winery Supply in parts of Sonoma County, the Sierra foothills, Santa Cruz mountains, and the states of Washington and Oregon.

For more information, contact:

Sparflex California
Rui Eduardo Bastos Amaro, V.P. of Sls/Mktg /Acct. Mgr., North America
Isabelle Prudent, Central Coast sales
Emily Ewins, inside sales/stock sales
50 Executive Ct., Ste. A, Napa, CA 94581
tel: 707/255-6718; fax: 707/255-6719
e-mail: rui.eduardo@sparflex.com, isabelle.prudent@sparflex.com
Northern California manufacturing plant:
425A Kunzler Ranch Rd., Ukiah, CA 95482
tel: 707/462-2963; fax: 707/462-2965

UNISOURCE WORLDWIDE, INC.

Unisource Worldwide, Inc. has introduced the first fully compostable, clamshell wine shipper trays to help vintners and purveyors of wine meet their green needs.

Made from recycled newsprint, recycled corrugated paperboard, and water, the wine shipper trays meet or exceed all packaging toxic limitation standards, such as the state of California's *Toxics in Packaging Prevention Act* and the European Union's *Directive 94/62/EC*.

The new wine trays provide optimal bottle and label protection using high-quality materials and design innovation. The use of recycled materials in the new trays is in keeping with Unisource's commitment to sustainability and environmental responsibility.

The clamshell packaging units come in one-, two-, or three-750ml bottle sizes.

In addition to being environmentally-friendly, the clamshell packaging offers cost benefits. The innovative design reduces warehouse space and freight costs; cuts time and labor costs by easing de-nesting; and protects buyers from major price fluctuations because manufacturing costs are not linked to gas, oil or resin prices.

For more information, contact:
Unisource Worldwide, Inc.
Rod Levitt, Director, Wine Packaging Sales
3352 Coffey Ln., Ste. B
Santa Rosa, CA 95403
tel: 707/526-7805; fax: 707/526-1407
e-mail: levitr01@unisourcelink.com

G3 ENTERPRISES

G3 Enterprises is a single source packaging and logistics solution with over 45 years of experience serving the wine and spirits industries.

New offerings include the VINOTOP NA™ synthetic cork and a new mobile bottling line.

VINOTOP NA™, a co-extruded, alternative wine cork, is designed to protect both popular and premium wines. It is available in 36- and 42-mm lengths, and a variety of colors.

The new mobile bottling line, serving all of California, has the capability to fill up to 4,000 cases per 8-hour day. Customers can choose from bottling services including:

- bottle cleaning/sparging;
- filling;
- closure application (cork + capsule [PVC, polylam or tin] or screwcap);
- pressure-sensitive labeling;
- bottle production coding;
- packaging;
- in-line case printing;
- glue case-sealing;
- palletizing.

QUALITY · VALUE · SERVICE · G3 · ENTERPRISES ·

G3's portfolio of products and services includes:

Labels — Pressure-sensitive and cold glue;

Closures — Capsules, screw caps, and synthetic corks;

Logistics — Grape hauling, warehousing, transportation, and importing/exporting;

Mobile Bottling;

Lab Services — Package integrity testing, oxygen management, TCA remediation, and process modeling;

Bottle Decorating — Bottle etching and heat transfer labels.

For more information, contact:
G3 Enterprises
Kimberly Jussely, Marketing Specialist
502 E. Whitmore Ave., Modesto, CA 95358
tel: 209/341-6813 or toll-free: 800/321-8747
e-mail: kimberly.jussely@g3enterprises.com

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WINE MICROBIOLOGY by Robert Tracy with Bevan Skaalen

Cost of reactive wine microbe management

Even though wine is an inhospitable environment to the vast majority of microorganisms found in nature, due to its acid and alcohol content, there are still a plethora of microbes that can survive in wine. The microbes that exist in wine do not pose a threat to human health, but they can cause spoilage, thus negatively impacting wine product quality.

The various types of wine spoilage caused by yeast, bacteria, and mold include off-aromas/off-flavors (acetic acid, ethyl acetate, 4-ethyl phenol [4-EP], buttery, 2,4,6-trichloroanisole [TCA], and mousiness), cosmetic issues (films, sediment, viscosity, and off-colors), bitterness, and formation of compounds that can affect human health (biogenic amines and ethyl carbamate).

Unfortunately, prevention and management of wine spoilage microbes can be difficult, complex, and costly for several reasons:

- a wide variety of spoilage microbes can exist in wine,
- multiple spoilage issues can be caused by a single microorganism,
- a single wine defect can be caused by different microbes, and
- winemaking is generally a prolonged process.

A comparison of the cost of proactively versus reactively managing wine spoilage microbes demonstrates that vintners who wait until they have a problem pay a significantly higher price than those who take a preventive approach.

In many industries around the world, companies use a tool called the "Cost of Poor Quality" (COPQ) to determine the direct and indirect costs that are generated as a consequence of producing defective products.

Direct costs include: all costs up to the point of rejecting a product, and then the rework costs, cost of labor and material, disposition cost, and lost opportunity costs.

Indirect costs include: loss in market share, cost of failing to meet customer expectations, lost potential for higher profits, cost of reduced operating efficiency, costs associated with disposal of defective material, and labor associated with ordering replacement material.

When COPQ was examined across several industries, it was estimated that, for the average manufacturing and service companies, COPQ accounts for 20% to 40% of gross sales each year.[1] Taking 20% of sales as a starting point, this means that most companies spend one entire day of each five-day workweek dealing with COPQ (rework, labor, materials, etc.). That's at least 52 days of lost revenue every year, which for many companies can add up to millions of dollars each year.

Reducing COPQ can be achieved by instituting a Quality Management System (QMS) that provides a closed loop corrective action process. In a production operation, when nonconformances, deviations, out-of-specifications, and customer complaints occur, corrective actions need to be instituted to resolve quality problems. The concept of how a QMS can be specifically applied to the winemaking process will be the subject of a later column.

In the past 10 years, technological advances throughout the supply chain have reduced barriers to entry for wineries worldwide, resulting in an extremely competitive marketplace. This competition has significantly elevated the quality expectations for wine producers.

The combination of more regulations being enforced for wine products (primarily in Europe and Japan) and more discerning wine consumers is driving wine producers to continually improve the quality of their product. As grapegrowers and wineries continually drive to improve product quality, they must start taking into account the concept of COPQ, so they can minimize revenue losses. COPQ can be applied to all production aspects of the wine industry, from grapegrowing through wine distribution.

We can use the concept of COPQ in the wine industry to compare the cost of proactively versus reactively managing wine spoilage microbes during the winemaking process, for example. By tracking the cost of each approach, (from grape receiving to finished product), we can see how reactive management leads to significant increases in both direct and indirect costs for a winery.

Direct cost analysis of proactive and reactive wine microbe management

When examining a microbial management program from a cost perspective, it is critical to take into account its relationship to COPQ. When looking at the costs of an effective microbial monitoring program, costs can be deceiving.

At first glance, the cost of monitoring a winery's inventory can look prohibitive, and the benefits can be deceptively hard to quantify. From a COPQ perspective, however, the benefits gained by establishing an effective microbial management program can lead to the realization of substantial cost savings in addition to the known quality benefits.

For example, let's perform a basic cost/benefit analysis for two fictional wineries producing premium wine. The first winery has adopted a proactive microbial management program with the intent of improving overall wine quality while at the same time reducing the probability of rework. The second winery is operating in a reactive style, in which remedial actions are taken after defects are found in their inventory.

Table I shows the direct costs that the two wineries would theoretically incur as a result of proactively in place of reactively managing wine spoilage microbes during a one-year period.

Indirect cost of reactively managing wine spoilage microbes

The indirect costs of reactively managing wine spoilage microbes, while not easily quantifiable, are usually greater than direct costs and thus can have a more dramatic impact on the winery bottom line. Indirect costs are not immediately apparent, but rather develop over the long run.

For example, during wine production, wine microbes can cause the formation of VA, 4-EP, 4-EG, TCA, or mousiness. At high levels, these compounds must be removed for regulatory and/or quality reasons, which can lead to reduced operating efficiencies. If these types of wine deficiencies occur over an extended period of time (several years in a row), employees can start to lose confidence in the quality of the product they are involved in producing, which can lead to reduced employee performance and retention.

The indirect costs associated with generating poor quality products do not end within the confines of the winery, but can extend into the marketplace also. For example, if formation of the above mentioned compounds are not managed proactively and they are present at organoleptically detectable levels in product sent to the marketplace, a high probability exists that the winery will lose customers: 1) distributors or restaurants will delay or even prevent entry into the market, and/or 2) consumers will reject the wine. Both of these scenarios can significantly cut into a winery's annual revenue.

Summary

The above analysis of the direct and indirect costs associated with the reactive management of wine spoilage microbes demonstrates how critical it is for each winery to develop, implement, and maintain a proactive microbial management program. In the above scenario, the cost savings associated with program amounted to an annual savings of $28,294. These savings are in addition to the product quality increases that would be realized due to decreased rework and handling of the wine.

Although there are many different theories regarding the frequency of microbial monitoring necessary, the types of analysis to be performed, and the acceptable limits of microbes, the key point of this column is to demonstrate how important it is for wineries to take a proactive approach to managing microbes. In the long run, wineries that employ a proactive microbial management strategy will benefit from reduced costs and improved quality wines.

"The Bad Wine Lady"

Lisa Van de Water is well known for her ability to diagnose and prevent microbial spoilage and fermentation problems.

Winemakers ask...

What do microbe test numbers actually mean to each of my wines? What is 'viable non-culturable'? How to plan yeast nutrition, restart a stuck ferment, manage *Brettanomyces*, or avoid *Lactobacillus* spoilage?

How to combine genetic and traditional microbe testing methods, streamlining protocols to give more meaningful results and save money at the same time? *Just ask Lisa.*

THE VINOTEC GROUP

707-953-7072 - badwinelady@aol.com

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www.corkqc.com
Includes the CQC Bottling Handbook

Table 1: Direct costs associated with proactively in place of reactively managing wine spoilage microbes*

Winery #1 — Proactive microbial management approach

Activity	Cost Location	Cost Location	Cost Location	# Wine Lots	X	Frequency of Activity (#/yr)	X	Average Cost	Total Cost for Activity
Microbiology Monitoring	Wages & Benefits	Laboratory Supplies		15		7		$50	$5250[1]
Oenological Practices	Wages & Benefits	Filtration		N/A		15		$50	$750[2]
Wine Preservation	Wages & Benefits	SO_2 Additions	Lysozyme Additions	N/A		1		$3180	$3180[3]
Rework (VA Removal)	Wages & Benefits	Vendor		N/A		0.5 (50% Reduction)		$8195	$4098[4,5]
Rework (4-EP/4-EG Removal)	Wages & Benefits	Vendor		N/A		0.5 (50% Reduction)		$8195	$4098[4,6]
Rework (Additional Filtration/ Wine Movements/ Treatments)	Wages & Benefits	Filtration Supplies		N/A		0		$0.00	$0.00[7]
Root Cause Analysis	Wages & Benefits			N/A		0		$0.00	$0.00
Total Annual Cost									**$17,376**

Winery #2 — Reactive microbial management approaches

Activity	Cost Location	Cost Location	Cost Location	# Wine Lots	X	Frequency of Activity (#/yr)	X	Average Cost	Total Cost for Activity
Microbiology Monitoring	Wages & Benefits	Laboratory Supplies		15		0		$0.00	$0.00
Oenological Practices	Wages & Benefits	Filtration		N/A		15		$50	$750[2]
Wine Preservation	Wages & Benefits	SO_2 Additions	Lysozyme Additions	N/A		0		$0.00	$0.00
Rework (VA Removal)	Wages & Benefits	Vendor		N/A		1		$8195	$8195[4,5]
Rework (4-EP/4-EG Removal)	Wages & Benefits	Vendor		N/A		1		$8195	$8195[4,6]
Rework (Additional Filtration/ Wine Movements/ Treatments)	Wages & Benefits	Filtration Supplies		N/A		1		$28,000	$28,000[7]
Root Cause Analysis	Wages & Benefits			N/A		2		$640	$1280[8]
Total Annual Cost									**$45,670**

*Assumptions:

1. Monitoring includes bi-monthly microbial plating.
2. Assuming one filtration per lot.
3. Assuming that 12,000 gallons of wine needs to be treated with lysozyme.
4. Early identification of potential spoilage microbes leading to early intervention to prevent spoilage (i.e. increased SO2 levels, lysozyme, filtration) reduces the requirement for VA removal and 4EP/EG removal by 50%.
5. Presence of wine spoilage microbes causes 12,000 gallons of wine to be treated for VA removal at a cost of $0.60 per gallon.
6. Presence of wine spoilage microbes causes 12,000 gallons of wine to be treated for 4-EP/4-ethyl guaiacol (4-EG) removal at a cost of $0.60 per gallon.
7. Decreased rework necessary for additional filtration, wine movements, and wine treatments leads to a reduction of one headcount for winery cellar crew.
8. Each root cause analysis event requires four employees eight hours to complete at an average of $20 per hour per employee.

Dr. Robert Tracy, with nine years of scientific research experience and seven years of winery laboratory and quality control/-quality assurance experience, specializes in wine chemistry and microbiology, winery sanitation, and QA/QC. He is co-founder of BevTrac Mobile Quality Systems LLC, based in Windsor, CA (www.bevtracquality.com), providing a mobile wine laboratory and consulting services to the wine industry. Please direct inquiries to robert.tracy@bevtracquality.com or tel: 707/239-8581.

Bevan Skaalen has eight years' experience implementing quality assurance/control techniques in the biotechnology and wine industries. He specializes in QA/QC programs, and process optimization techniques. He is the co-founder of BevTrac Mobile Quality Systems and can be reached at bevan.skaalen@bevtracquality.com or tel: 707/239-8579. ■

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COMPLIANCE COUNSELING *by Rachel Dumas Rey*

Hospitality compliance guidelines for California wineries

Laws regarding hospitality activities at wineries are generally created and enforced at the state level. In California, the Department of Alcoholic Beverage Control (ABC) is charged with the permitting and ensuring compliance with regulations and policies that govern hospitality functions for wineries, including wine tasting and events, such as festivals and winemaker dinners.

There is much confusion about what a winery can and cannot do in tasting and event settings and this column offers basic compliance guidelines for California wineries in these areas.

Tasting rooms

All licensed California wineries may sell their wines directly to consumers. In addition, unless local zoning rules prohibit public tasting, the ABC allows the public to sample wines at the winery or at the winery's licensed offsite tasting room.

A licensed winegrower in California must produce not less than 50% of the wine sold on its licensed premises to retail consumers, and a winery may not sell wine brands it does not own. Sales of other retail items — such as T-shirts and glassware — are not regulated by the ABC and are permitted by most local zoning authorities.

California ABC wine-tasting guidelines make the distinction between a *taste* (no more than one ounce) and *onsite consumption* (any serving larger than one ounce). The purpose of wine tasting is to allow the consumer to become acquainted with a wine, and the California Legislature has determined that one ounce is adequate for that purpose.

Tasting room staff use special pouring devices that release only a one-ounce pour or glassware with a line that clearly marks a one-ounce serving. A winery may only provide three one-ounce samples of its product (wine produced for or by the winery and under labels owned by the winery) while furnishing samples at an on-sale licensed premise. Wineries are not authorized to sell a glass of wine for consumption although they may charge a fee for tasting if they choose.

A "single tasting of wine" is defined as a one-ounce pour in the context of an on-sale licensee instructing consumers in a section of the code about on-sale licenses. ABC published a memo (May, 2007) stating that the intent of Rule 53 governing wine tasting at wineries is the same.

Duplicate licensing

Licensed California wineries may have one onsite tasting room adjacent to their production facility and one offsite tasting room. A winery operator with an offsite tasting room must hold a duplicate Winegrower license for that location. A duplicate license may also be issued for offsite warehousing or a business office. The rules are the same for onsite and offsite tasting rooms.

Shared tasting rooms

Like offsite tasting rooms, shared tasting rooms must adhere to the same laws and regulations as a stand alone tasting room, and each participating winery must apply for and obtain a duplicate license at the shared facility. Each licensee will be required to sign specific conditions for the operation of the joint tasting room.

The issuance of a duplicate license for a shared tasting room counts as a winery's one offsite tasting room. Guidelines are subject to interpretation, but generally, shared tasting rooms must use some sort of divider on the tasting bar to define the areas where each licensee's wine will be poured. The remainder of the room may be shared.

Individual wineries must maintain separate accounting records and pay their own taxes. The wineries may share tasting room staff, but all licensees are held responsible if one party violates any laws or regulations.

Picnic areas

Many wineries have outdoor spaces and picnic areas adjacent to their production facilities. It is common practice for wineries to allow guests to drink wine in these areas, which are not part of the licensed winery. Winery staff should not open a bottle of wine that has been purchased for this purpose.

Until recently, rules about wine consumption at wineries have been low on the list of ABC enforcement priorities, but the agency does have the authority to bring a nuisance case against a winery for allowing this activity, whether the picnic area is part of the licensed premises or not. The rationale is that the law does not permit people to buy a beer at 7-Eleven and drink it in the parking lot, so they shouldn't be able to go to a winery and essentially do the same thing. We can expect more scrutiny from ABC in this area in the future.

In addition to mounting concerns about onsite wine consumption at wineries, wine sales to minors are becoming an area of special concern, and the ABC has conducted sting operations at wineries in recent months. First-time offenders can expect a 15-day suspension of their license and a $750 to $3,000 fine. Repeat offenders will face greater penalties, including revocation of their license.

AB 2004

In February 2008, California Assemblywoman Noreen Evans (D-7th district), who represents Napa, Solano, and Sonoma counties, introduced Assembly Bill 2004 to legitimize onsite consumption of wine in designated areas at wineries. Originally, the bill created a duplicate license for an area outside the winery premises for consumption of wine purchased at the winery.

This concept of a "picnic license" was short-lived, and the bill was amended to allow consumption in wine tasting rooms or at adjacent picnic areas without any additional license. The bill, which is sponsored by the California Wine Institute, was unanimously passed by the California

Assembly Organization Committee in April. AB2004 was passed by the California Assembly on May 15, 2008. The Senate Government Organization Committee will hear and vote on the bill some time in June and the full Senate will vote on the bill some time this summer.

Onsite winery events

Typically, two types of events are held at wineries — those that showcase the wines (such as winemaker dinners) and those in which a person or group leases the winery for a charitable event. Both kinds of events are permissible and may occur after regular business hours, although not between the hours of 2 AM and 6 AM.

The purpose of a winemaker dinner is to provide an intimate experience in which consumers can get to know the character, nature, and history of the wines. These dinners also allow consumers to learn more about the wine in relation to food, an opportunity that is not usually available in a tasting room.

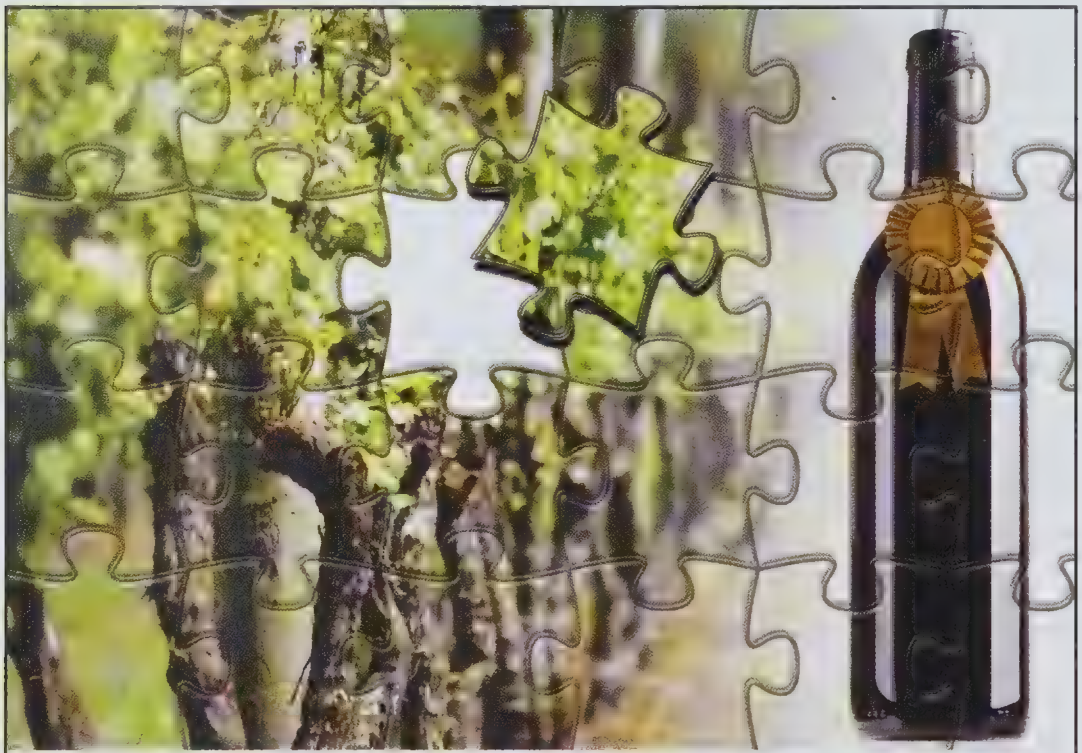
Winemaker dinners that are not open to the public and are attended by invited guests are considered to be private events. During private events, wineries may sell full glasses of their own wine, and wine and beer purchased from a wholesaler to patrons during private events held at the licensed premises. The same rules apply when a winery leases a portion of its facility for a wedding or other private event.

Wineries often host charitable fundraisers for nonprofit groups. If the nonprofit group wishes to have wine or other alcoholic beverages (sparkling wine, for example) available for guests, a licensed caterer must obtain a license to sell and serve wine or beer not produced by the licensed Winegrower in addition to the wine produced on site.

The California ABC will issue one-day permits to nonprofit organizations for wine tasting and sales on the winery premises, but not within the licensed premises. The ABC may grant a catering authorization at a winery for beer and wine only. A winery may donate wine and labor to the nonprofit for the event.

If the winery desires to surrender its license for a private event and have a caterer bring in alcohol, ABC may grant a catering authorization at a winery for beer and wine only. Distilled spirits or cocktails may not be served inside the licensed winery area. If the event is on the winery grounds, but outside the license area, beer, wine and distilled spirits may be served.

The winery must submit an ABC-231 form surrendering its license for the date and time of the catered event and the caterer must obtain a Catering Authorization for the event. During these events, the caterer will obtain all the alcohol from wineries and wholesalers and will be the only business to profit from the alcohol sales.



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Offsite events

Offsite wine events regulated by California ABC include winemaker dinners at restaurants and festivals. Festivals include those sponsored by nonprofit organizations held for the purpose of promoting wine (even though the proceeds may go to an unrelated charity) and festivals and fairs with a broader scope, in which participation by wineries is not the focus.

A winery that hosts a dinner at an offsite restaurant may pour its own wine for dinner guests but must adhere to California ABC guidelines for tasting, meaning a one-ounce pour and not more than three one-ounce pours *per course* in a meal.

The main difference between winemaker dinners held at the winery compared to those held offsite is that wine (by the bottle or case) may not be purchased to take home at these offsite dinners — participants must place their orders at the winery during regular business hours.

Wine festivals often occur at wineries. The hosting winery must surrender its license for the event so that the nonprofit sponsor can obtain a one-day event permit for that location. One-day permits can also be obtained for events in public spaces, such as parks. Wineries may pour wine for consumers to taste inside the designated event area, but they may not sell wine (by the bottle or case) at the event.

The California ABC licenses other nonprofit sponsored events, including fairs and cultural gatherings, to allow wine tasting. For these events — where wine tasting and promotion are not the primary focus — wineries can obtain a wine sales event permit that allows them to sell wine directly to consumers.

The permit is available from ABC, and no public posting is required. The annual fee is $50, and the permit holder must obtain ABC approval before each event. Wine sales are limited to 1,250 gallons per event and 5,000 gallons annually. The permit may not be used more than twice in a month at any one location.

Unfortunately, the California ABC does not publish an operating guide for wineries and tasting rooms. Additional information may always be obtained from your local ABC office and a listing of those offices can be found at www.abc.ca.gov. ABC offices conduct training and outreach with individual wineries and wine trade associations upon request. ■

Rachel Dumas Rey is president of Compli, a full service beverage compliance firm in Paso Robles, CA. Prior to establishing Compli in 1997, she worked for the U.S. Department of Commerce's Export Administration in Washington D.C.

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PERSONNEL POINT OF VIEW *by Anne Heron*

Management metrics: It's in the numbers

How do you know if you're doing all you can to be an effective manager? The bottom-line measure of your effectiveness as a leader and people-developer is whether your team achieves the results expected. But does this really give you the whole picture, or provide you with the information you need to take action? Perhaps you could have taken steps to strengthen your team's performance — perhaps they could have surpassed the goal.

Winery managers often ask us what metrics they should be using as key indicators of effectiveness. These leaders are used to checking the pulse of their performance on a regular basis in other areas of their jobs — using monthly budget reports to monitor financial performance; or sales revenue reports for sales performance, for example.

When it comes to people management, most winery managers measure effectiveness by looking at numbers, such as turnover; absenteeism; percentage of performance reviews completed on-time; salary actual to budget; and FTE to budget. While these numbers are interesting, many of them are transactional measures used to monitor compliance with procedures. These metrics don't tell us whether the performance review provided valuable feedback to the employee or the salary is competitive. They don't tell us about conditions that could be changed to prevent or reduce absenteeism and turnover.

More valuable measures are proactive and strategic and ensure you are being as effective as possible in your people management responsibilities. In this column, we will discuss such metrics in three key areas – hiring, orienting, and developing staff. They will help put you on the right track. In each area, there are two types of measures: "leading indicators" and "performance measures." Leading indicators can be put in place proactively and are designed to monitor processes that have been shown to significantly increase the effectiveness of a management activity. Performance measures help you assess the effectiveness of a management activity after it has taken place.

QUALITY OF HIRE — One of the most important decisions you make as a leader is selecting who will be part of your team. To assure "quality of hire," your selection process must be grounded in the requirements of the job: knowledge, skills and abilities; attitude and motivation; and cultural fit, both with the organization and with your customers.

In many organizations, the measures associated with the staffing process are transactional: cost of hire, time to fill the job, and so on. More valuable measures tell you whether the candidate is a great fit for the position. To ensure you have created the optimal selection process that will consistently lead to high quality hires, here are some numbers you could review and strive to improve.

LEADING INDICATORS — Measure the percentage of staff positions with the following in place:

- Thorough, current job descriptions defining the duties and requirements for the job;
- Thorough, current job profiles defining the attitude, motivation, and cultural fit requirements of the job;
- Standard interview questions that gather data on the skills and motivational requirements of the job;
- Assessment tests identified where skill evaluation is required;
- "Ready now" persons of talent have been identified, either internally or externally.

PERFORMANCE MEASURES — Ninety days after the hire, managers use these measures to evaluate the new hires:

- Overall fit of skills and abilities to job requirements;
- Motivational fit for the job;
- Overall productivity;
- Likelihood to stay with the winery; and
- Probability of promotion or exceptional performance after one year.

TIME TO CONTRIBUTION — When a new employee comes on board, there is always a learning curve. Even if new hires have done similar jobs in their prior employment, it takes time to learn the specifics of your winery's processes and your team's priorities. This learning curve eats into the productivity of the team and its ability to achieve its goals. There is also a cost to employee satisfaction. Studies show that when new employees are left floundering, they lose motivation and confidence. It then becomes even more difficult to integrate them into the organization.

Most organizations do not measure the effectiveness of their orientation practices. If measures do exist, they are often designed to ensure that employees have received the required paperwork or mandated training. Thorough orientation and integration into the team are key to making your new hire a valuable addition to your workforce. In order to shorten the time it takes to bring them to productive performance, there are a variety of metrics you could monitor.

LEADING INDICATORS track the percentage of:

- Processes with procedure manuals outlining key steps in the process: resources required, frequently asked questions, and "go to" person for decisions and support;
- Departments with orientation programs, including an overview of the department's mission and goals, description of various positions and responsibilities, meeting key individuals who interface with the position and department, establishing a "buddy" to provide information and support during the first 90 days, etc.;
- Positions with clear 90-day goals, including specific action steps, resources, and check-ins to ensure successful completion, and;
- Positions offering formal training, if required to master the tasks.

PERFORMANCE MEASURES — Measure the percentage of new hires who are:

- Productive within the appropriate amount of time; and
- Achieving performance objectives after 90 days.

VALUE CREATION — Once an employee has been integrated into the team, the management challenge becomes creating value for the organization through this human resource. For some of us, talking about people as "resources" seems cold and mechanical. After all, a person is not a thing, like a barrel or a bunch of grapes.

Nevertheless, a person is a resource, one with associated costs, such as wages, benefits, and equipment. Understanding the value gained through this expense is important from a purely business perspective and from a human perspective. Studies show that people who know they are adding value to the organization they are working for are much happier in their jobs than those who are not aware of their contribution.

HOW DOES AN EMPLOYEE CREATE VALUE? The most obvious way is through productivity. Are the products or services they produce generating income for the winery? Does that income offset the expense of their employment?

Usually managers are clearly focused on this type of value creation. Many do a great job of ensuring that employees know the mechanics of their jobs and are able to produce results at an acceptable level. These managers use regular performance reviews and staff meetings as tools for providing feedback and problem solving support, which in turn increase productivity.

The second type of value creation is achieved through growth and development. By gaining knowledge and skills, the employee becomes more able to add value to the winery. Many managers and organizations are not strategically focused on this aspect of value creation. In fact, training and development are often seen as expenses rather than as investments. One of the reasons we have seen for this is that skill building is not positioned within the organization as a value-creation activity.

Development activities are often measured as transactions — the number of participants, the number of sessions conducted. However, the value and success of these efforts are significantly enhanced when they are designed around strategically important skills and are evaluated based upon the capabilities that participants bring back into the workplace after their training experience.

The metrics listed here will help you monitor your efforts to position growth and development as strategic activities.

LEADING INDICATORS —

- The percentage of strategic results that have been analyzed to identify the core competencies required to deliver these results;
- The percentage of staff positions with identified strategic core competencies; and
- The percentage of strategic core competencies with skill-building training or mentoring programs.

PERFORMANCE MEASURES —

- The percentage of employees rated competent or better in the strategic core competencies of their positions;
- The percentage of employees cross-trained;

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- The percentage of leadership positions filled from within;
- The ratio of the dollar investment in training to the dollar increase in sales;
- The ratio of the dollar investment in training to the percentage increase in customer satisfaction; and
- The percentage of front-line staff rated knowledgeable, timely, helpful, and courteous by customers.

Conclusion

Finding ways to measure and monitor your success as a leader and developer of people can be challenging. However, the results will be well worth the effort. Studies have shown that the very fact of measuring and monitoring brings an activity into focus and causes improvement. If you choose to implement one or more of these measures, you will see the impact.

It has been said, "One measure of leadership is the caliber of people who choose to follow you." You could also say that another measure of leadership is the caliber of people YOU choose and develop. These metrics will help you choose and develop a team of excellent people. ■

Anne Heron is a Senior Associate with The Personnel Perspective, the North Bay's leading management consulting firm with expertise in Strategic Human Resources, Leadership and Management Training, Executive Search, and Recruiting. Anne has over 25 years of management and HR experience. You can contact her at 707/576-7653.

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Sustainable Ag Expo	89	805-369-2288		sustainableagexpo.org
Tonnellerie Boutes	8	510-799-1518	510-799-1557	boutesusa@aol.com
Tonnellerie Quintessence	30	707-935-3452	707-935-3422	tonnelleriequintessence.com
Tonnellerie Saury USA	40	707-944-1330	707-944-1370	info@sauryusa.com
Turrentine Brokerage	29	415-209-9463	415-209-0079	turrentinebrokerage.com
TW Boswell	14	707-255-5900	707-255-5952	info@twboswell.com
Vinotec Group	91	707-224-1813	707-224-4028	vinotecnapa@aol.com
Vinquiry	70	707-838-6312	707-838-1765	info@vinquiry.com
Weedbadger	78	800-437-3392	701-778-7501	info@weedbadger.com
Westec Tank & Equipment	34	707-431-9342	707-431-8809	westectank.com
Western Square Industries	25	800-367-8383	209-944-0934	westernsquare.com
The Winegrowing Consortium	94	888-897-3030		winegrowingconsortium.com
World Cooperage	100	707-255-5900	707-255-5952	info@worldcooperage.com
Xtra Oak	37	707-836-9742		xtraoak.com
Yokayo Wine Company	35	707-463-3366	707-463-3365	yokayowineco.com

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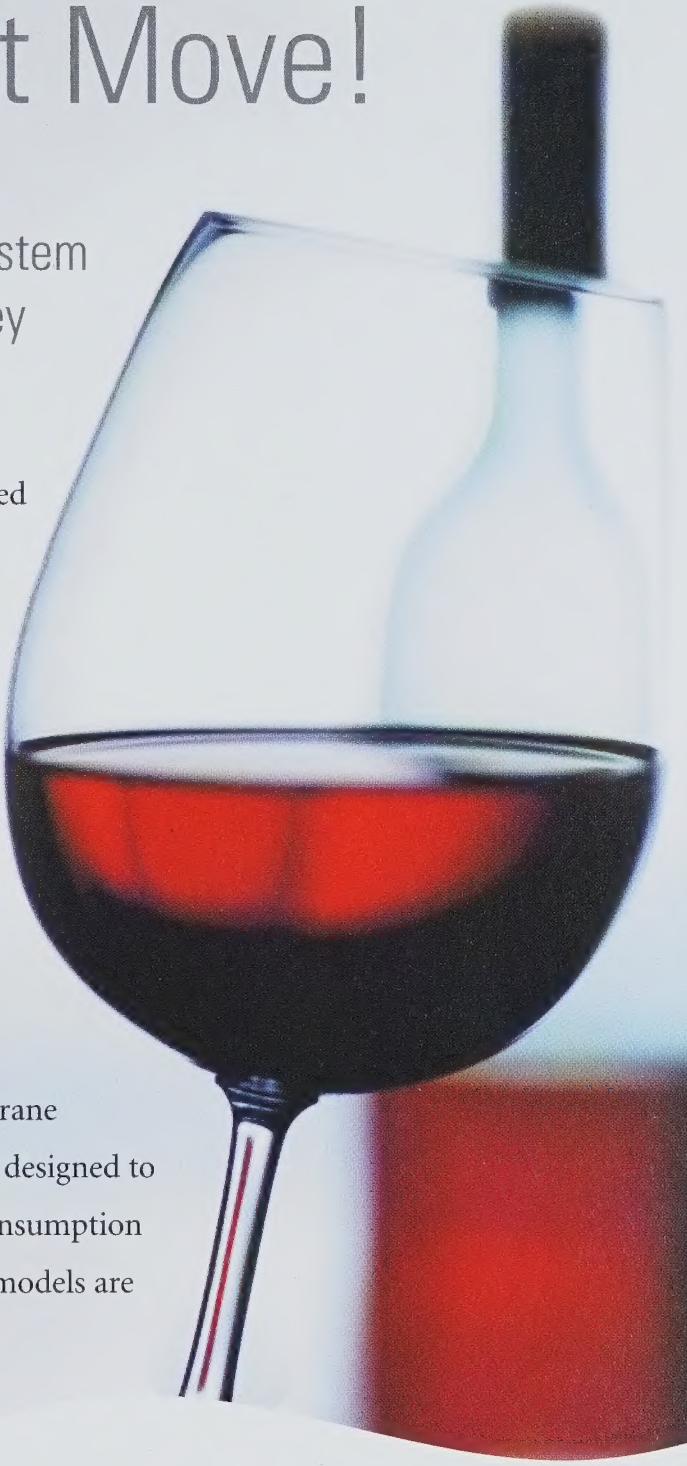

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Winemaker
Ferrari-Carano

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